THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—46TH YEAR SYDNEY, SATURDAY, JANUARY 3, 1959 No. 1

Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— Page

The Jackson Lecture—Progress in Psychiatry, by G. B. Murphy .. 1
Thirty Years of Juvenile Rheumatism, by Laurence Hughes .. 7
Another Look at the Problem of Lumbo-Sacral Pain and Sciatica, by Thomas King .. 8
Some Problems of Lung Cancer—a Physician's Viewpoint, by H. Maynard Rennie .. 12
Some Observations on the Pathology and Treatment of Carcinoma of the Lung, by John Hayward 14
The Limitations of the Radiological Method in the Diagnosis of Carcinoma of the Lung, by M. G. F. Donnan .. 18

REVIEWS—

Baillière's Nurses' Dictionary .. 19
Structural Psychology .. 19
Science and Psychoanalysis .. 20
Leptospirosis in Man and Animals .. 20
New Biology .. 20

BOOKS RECEIVED .. 20

LEADING ARTICLES—

The Matrix of Medicine .. 21

CURRENT COMMENT—

The Value of Cardiac Patients in Industry .. 22
Problems in Electrocardiography .. 22
Is the Large Mental Hospital Bankrupt? .. 23
The Prophylactic Use of Gamma Globulin .. 23
Half-Yearly Index to "The Medical Journal of Australia" .. 23

ABSTRACTS FROM MEDICAL LITERATURE— Page

Pathology .. 24
Therapeutics .. 25

BRUSH UP YOUR MEDICINE—

Antimalarial Drugs at Present in Use for the Prevention and Treatment of Malaria .. 26

OBITUARY—

Robert Officer .. 27

CORRESPONDENCE—

Medicine in China .. 29
Physiological Mechanisms in Heart Failure .. 29
The Future of the Australian Aboriginal .. 29
The Patient, the Surgeon and the Anæsthetist .. 30
Tropical Pulmonary Eosinophilia .. 30
Mumps Encephalitis in an Adult .. 30

PUBLIC HEALTH—

Gamma Globulin Prophylaxis .. 30

POST-GRADUATE WORK—

Royal Prince Alfred Hospital: Ear, Nose and Throat Department .. 31

NOTES AND NEWS .. 31

DIARY FOR THE MONTH .. 32

MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. 32

EDITORIAL NOTICES .. 32

The Jackson Lecture.[1]

PROGRESS IN PSYCHIATRY.

By G. B. MURPHY,
Brisbane.

I SHOULD like to thank the Council of the Queensland Branch of the British Medical Association for inviting me to deliver the Sandford Jackson Lecture for 1957. This is a great honour and a responsibility that is not easy to discharge, and I am very conscious of the standard of excellence that may be expected on such an occasion. I am afraid I have not the capacity to develop a new idea or introduce a clear and penetrating argument upon some aspect of medicine. Instead I take this opportunity of looking back upon the past in an endeavour to obtain some idea of how far we have come along the road of progress, particularly with reference to psychiatry, a subject which is my own interest.

Dr. E. Sandford Jackson, in whose honour this lecture is given, was himself considerably interested in medical history, and I hope he would approve of my choice of subject. He was born in 1860 in Victoria and graduated at Melbourne in 1881. The following year he came to Brisbane and was Medical Superintendent of the Brisbane Hospital from 1882 to 1898. In 1885 he founded in the Brisbane General Hospital a training school for nurses, the first to be established in Queensland. Dr. Jackson was a foundation member of the Queensland Branch of the British Medical Association, and was President of the Branch in 1895, 1911 and 1926, and was a member of the Council for varying periods until 1929. He was a voluminous writer on diverse subjects, including matters of medical history. In fact he himself gave the first Sandford Jackson Lecture in 1931, his subject being "Some Voyages Connected with the Discovery of Australia: Their Medical History". Like many other people interested in this subject, he was a collector of items of historical value, and much of his material has found its way to the Church of England Grammar School at East Brisbane. This collection comprises manuscripts dealing with the early days of Australian and Queensland settlement, the Barrier Reef, the travels of Henry Stewart Russell, Oxley in Moreton Bay in 1824, and the accounts of some old time wrecks. It also includes a large number of maps of Australia, Queensland, New Guinea, the Coral Sea, the Barrier Reef and a scale map of Brisbane dated 1840. However, we must leave these interesting observations made by Dr. Sandford Jackson and return to our subject, progress in psychiatry.

In this age of exciting discoveries and publicity given to scientific advances and new forms of treatment, it appears to be a commonly held impression that there are very few

[1] Delivered at a meeting of the Queensland Branch of the British Medical Association on

illnesses which have not a satisfactory cure or means of treatment; or if this is not yet true, then we are so advanced in knowledge that we can imminently expect an authoritative announcement. It is a happy thought, and we live in hope. However, one sometimes doubts whether we have come as far as we believe. In current medical journals we are accustomed to read of new methods of treatment. We are usually offered a series of cases with a conspicuous number responding to the new therapy, but all too frequently it happens that after a short burst of enthusiasm this particular treatment becomes less and less heard of until finally it passes out of fashion, becoming something of a medical curiosity. Like so much of human endeavour, it is born of hope and enthusiasm, but these alone will not solve any problem, without some happy association of ideas. However, progress would be impossible without such experiments.

In preparing this lecture I have taken down from the shelves the works of some of the older writers, and in addition to finding them most instructive I have been fascinated by their wonderful literary qualities and their quaint and charming expression. It has been an interesting study, something I have wanted to do for a long time, and I am again grateful to the Council for affording me sufficient incentive.

In a lecture that is to spend a little time considering the progress made in psychiatry it will be necessary to try to establish the situation as it existed in days gone by, in order to have a base line with which to compare our present position. This period will have to be sufficiently remote to allow an appreciation of the gradient of our progress, and yet not so far away as to be out of the range of recorded history. By tracing something of the known past history of this subject of psychiatry, it may be possible to determine the present position and perhaps to see more clearly just how and why it developed in this way. However, it will be realized that this assessment is necessarily incomplete, as it would be quite impossible to presume to cover all the fields in which progress has been made and which could be included under the title of the present lecture. I picture the situation, as one looking back over certain ground that he has examined, with the realization that another reader might be impressed by different material in an entirely different way.

I recently came upon some remarks concerning Thomas Sydenham, a famous seventeenth century physician, who was born in 1624 and died in 1689. Thus he was born a year before Charles I came to the throne and was a youth of 18 at the outbreak of the Civil War in 1642. He lived through the reigns of the four Stuart kings, the Protector (Oliver Cromwell) and King William. These were stirring times, a century which saw the successful founding of colonies in Virginia, New England and the West Indies, and the establishment of the first trading station on the coast of Hindustan. It was the age of Milton, Newton, Wren and Robert Boyle, the last mentioned being an acquaintance of Sydenham. It seemed a turning point in history, leading to an era of greater civilization, comfort and security. It also saw the outbreak of the Great Plague in 1665, and in the following year the Great Fire of London.

I think we might do worse than use the writings of Thomas Sydenham as our base line. This man, described by the medical historian Singer as the founder of modern clinical medicine, also holds an important place in the history of psychiatry. In the light of modern concepts, his penetration of the syndromes of medicine is quite remarkable. He took cases as he found them, asking what they taught, not what they proved. He gave priority to direct observation and had the capacity to analyse and draw comparisons. His description and classification of fevers are worthy of anyone's study. Not infrequently he apologizes for the tentative nature of his theory, but stoutly maintains that ". . . in all points of practice I speak nothing but the truth". Elsewhere he states: "It appears . . . the cause of the majority of diseases is inscrutable and inexplicable—the question of how to cure them is nevertheless capable of solution."

Comparatively little is known about the details of Sydenham's life except that he was a soldier in the Parliamentary army, that he pursued some short studies, that he was a martyr to gout, and that he suffered from renal colic. When he was asked by Sir Richard Blackmore the best books to study in order to acquire medical knowledge, he replied "Don Quixote". The significance of this remark is somewhat obscure, but it is suggested that it may have been a calculated rudeness or more probably referred to the fact that medicine is not to be learned from books. Sydenham was a Licentiate of the College of Physicians and was not elected a Fellow, it is said, because of his political inclinations.

"The Works of Thomas Sydenham, M.D., Translated from the Latin Edition of Dr. Greenhill", published in 1848 in two volumes, contain a great deal of the information relating to this remarkable personality. I have been able to obtain access to these two volumes through the courtesy of the Queensland Institute of Medical Research Library. The books consist of observations and commentaries on medical subjects, particularly the fevers and the epidemics that occurred round about the 1660's, but they also include 60 short chapters or notes on a great variety of subjects, e.g. gout and dropsy, venereal disease, apoplexy, ileac passion, biliary colic, jaundice not following colic, and the affliction called hysteria in women and hypochondriasis in men. There are also some correspondence and epistles to colleagues chiefly on medical subjects. I can find in these books no description of any autopsy being performed, but some of the explanations of disease, e.g. apoplexy, could have been made only if there had been post-mortem examinations, at least in some cases.

Concerning apoplexy, he writes:

> This disease (I suppose) proceeds most ordinarily from a gross, thick, phlegmatic humour, which, either obstructing the capillary arteries of the brain doth hinder the free access of the blood for the supply of animal spirits, or else, being protruded out of the same arteries into the cortex of the brain doth obstruct the passage of the animal spirits. Sometimes the apoplexy is caused by an extravasation of blood out of some of the capillary arteries and the effusion thereof upon the brain, whereby, the like obstruction of the animal spirits is produced, whilst, all the passages in the brain are stopped partly by obstruction, and partly by pressure from the load of blood lying upon it.

It may be of interest to hear a few general comments upon the fevers—the subject for which he is most renowned. This may also give some idea of the state of development of medical knowledge at that time. Sydenham recognized that certain fevers were influenced by the season, that some were transmitted by fomes (the plural of which is fomites). When discussing the outbreak of the various epidemics that occurred between 1661 and 1669, he writes of the "pestilential virus", and states that "either, the disease must continue to survive, in some secret quarter, or else from some fomes, or from the introduction from pestilential localities of an infected person, and even in these cases it cannot become epidemic except with the conditions of a favourable atmospheric diathesis".

In addition to these remarks on physical illness, we have Dr. Cole, a contemporary of his, exhorting him to write "concerning the so-called hysterical diseases". Dr. Cole writes:

> These have long exercised (and tried) the wits of physicians. They have also (alas) eluded the recognized methods of treatment, well showing how unsafe it is in our philosophy to trust to simple reason except in those matters of which we may ascertain the certainty by means of our senses.

Sydenham believed hysteria to be the most common single cause of all chronic diseases. Fever comprised two-thirds of his practice, chronic illness the remaining third, and hysteria constituted half of this. By his estimate, then, hysteria is responsible for one-sixth of all human maladies. He observed that "women, except those leading 'robust' lives, are rarely quite free from it"; moreover, he encountered similar illness in "sedentary and studious men". He states: "Hypochondriasis is like unto hysteria as one egg is to another." Our clinician appears to have been something of a purist and does not seem to have accepted the idea that hysteria could occur in men.

Speaking generally, he states:

> The frequency of hysteria is no less remarkable than the multiformity of the shapes it puts on. Few of the maladies of miserable mortality are not imitated by it. Whatever part of the body it attacks it will create the proper symptoms of that part. Hence, without skill and sagacity the physician will be deceived, so as to refer the symptoms to some essential disease of the part in question and not to the effects of hysteria.

He then proceeds to elaborate the presentations that may be met with when the illness affects various systems, and he states sometimes the diagnosis is difficult "unless there has been some antecedent mental emotion".

> In the teeth . . . without the smallest cavity, without any perceptible discharge, there shall be all the severe and intractable pain of toothache . . . Of all these pains, however, the most certain is the pain in the back. The least touch of the complaint brings it on. Almost all the hysterical women that I have ever seen complain of a dejection (a sinking as they call it) of the spirits . . . They speak of "eructions after meals", melancholy forebodings, fears, anger, jealousy and suspicion—the melancholy dreams of funerals and the shadows of departed friends.

How closely he described this state of neurotic depression! And then he adds: "In all this it is neither the maniac nor the madman we write about."

> As often as females consult me concerning such bodily ailments that are difficult to determine by the usual rules of diagnosis, I never fail to carefully enquire whether they are not worse sufferers when trouble, low spirits, or any mental perturbation takes hold of them. If so I put down the symptoms for hysterical—a diagnosis which becomes all the more certain whenever a large quantity of limpid crystalline urine has been voided.

The explanation of these ills he considers "is rather the faulty disposition of the animal spirits". He recommends "restoration of the blood, the source of the spirits".

Payne, one of his biographers, writing some 200 years after Sydenham's death, said that with Sydenham's exaggerated notions of the importance of hysteria it was natural that this doctrine should be carried to extremes and "he, Sydenham, thought this affection not only produced symptoms of disease but set up actual organic disease". Payne also added that Sydenham's explanation "depended upon an ataxia or disturbance of the animal spirits, which, rushing down upon the various organs of the body, excite pain and spasm".

"These phrases, 'animal spirits', 'physical pneuma' or 'breath of soul' are almost precisely the equivalent of 'nerve force' or 'nervous energy' as used in modern textbooks", writes Jerome Schneck, Clinical Professor of Psychiatry, New York College of Medicine, who takes the liberty then to quote Freud in contrast: "There can be no question that the libido has somatic sources, that it streams into the ego from various organs and parts of the body."

Sydenham's description of the symptoms and the natural history of the illness creates a feeling that is amazingly familiar. Perhaps we can find some more definite indications of progress if we pause for a moment to study some of the forms of treatment that were recommended by this old master. Bleeding and purging were commonly used, but in the case of "weak subjects" it is recommended to wash out the stomach with a gallon of posset. Posset, by the way, is a hot drink of milk curdled with wine and spices and special ingredients. Its purpose, according to Sydenham, was to "distend and open the passages—but it also caused great retching and vomiting—straining all parts of the body". He recommended it might usefully be employed in the quantity of a gallon or two. Laudanum was used to lessen some of the effects of too rigorous treatment. Venice treacle or theriaca, an antidote to bites of various animals, compounded of 65 ingredients, "used long and often is a sovereign remedy in this and all other diseases arising from want of heat". Sherry wine medicated with gentian, wormwood, or other restoratives, is recommended—three to four spoonfuls two or three times a day; "Peruvian Bark in simple doses has great value, especially in hysterical spasms". Milk is advised for the thin and bilious; but "nothing better keeps up the spirits and warms the blood like plenty of riding on horseback every day. Carriage journeys are also useful".

On perusing these short chapters on treatment, I could not pass over an indication of our clinician succumbing to the lures of American commercial medicine and developing the urge to try new drugs. Writing on the subject of the ileac passion he states: "The peristaltic motion of the intestines is reversed, so that purges and clysters are thrown up like emetics, and the fæces of the bowel are passed through the mouth and throat". He recommends several courses of action, one of which is "an hour or two after the bleeding to throw up one of the stronger clysters —e.g. tobacco smoke forced up through the bowel through a pipe from a large bladder". This, he suggests, may be repeated every few hours. It would indeed be unfortunate if we were to leave this great clinician upon a note of levity. William Osler writes: "As a portrayer of objective features he has few equals and in this he even bettered the instruction of his master, Hippocrates."

Precise information concerning the treatment of the psychoses during this century is not easily obtained. It is known that hospitals for the insane were instituted at an early date, a well known instance being St. Mary of Bethlehem Hospital or Bedlam in London, which was established as an insane asylum in the fourteenth century. A savage description of a visit to Bedlam can be found in Jonathan Swift's "Tale of a Tub", which was written in 1697. For a penny one could be conducted by a keeper to the cells to watch the posturing and mannerisms of these poor inmates, often reduced by illness to a state little better than that of animals. From the available information it would appear that this institution, and similar institutions in other parts of Europe, were conducted as a museum or human circus rather than as an asylum or hospital. Over 75 years later Boswell records that he and Dr. Johnson "went together and visited the mansions of Bedlam . . . the general contemplation of insanity was very affecting". There appears to have been little success in treating these acutely psychotic, restless and noisy patients. Some, no doubt because of their behaviour, were cared for like animals; chains and physical restraint were frequently in use, and recoveries must have been due to the natural tendencies to remission rather than to the influence of the attending physician.

Contemporary writers at the close of the eighteenth century, a hundred years after Sydenham's death, supply interesting details of the treatment meted out to George III during the acute episodes of the manic-depressive psychosis from which he suffered. When he became suddenly ill in October, 1788, it was thought to be "a flurry of spirits" caused by spending a whole day in wet stockings. "Then", records Grenville, later Prime Minister, "the physician's medicines repelled it from the bowels to the brain. (They) are now endeavouring by warm baths to bring it down to the legs again." The diarist Fanny Burney, from her position close to the Queen, gives us a fascinating account of the consternation in the Royal household and the sharp division of opinion among the eight physicians. They bled and purged the King until they despaired of ever being able to effect a cure, then let him alone, and in time, to the surprise of many of them, he recovered from his acute state of illness. The natural history and tendency to remission of this type of psychosis appear to have escaped the notice of the leading physicians of the day, and it appears that psychoses were not much studied. One is impressed by the complete change of attitude to the Royal person as soon as it became evident that he was in a psychotic phase. Not only was he not treated as the King of the Realm, but he was insulted and abused by his own sons and by those very people who at other times were much dependent upon his good graces.

A major step forward in the treatment of psychosis was made at the close of this century when two enlightened men, Phillipe Pinel in Paris (1793) and William Tuke at York, showed that such patients could be handled without the harsh physical restraints generally imposed. Their ideas were adopted slowly; it was not until 1828 in England that proper laws were passed governing the certification and detention of the mentally ill, and it was 1844 before all asylums were made subject to government inspection.

Half a century later we pause a moment to observe the situation in 1867 when Dr. Henry Maudsley, another clini-

cian and writer, records the situation in his time, chiefly with reference to the psychoses, in his book "The Psychology and Pathology of the Mind". The descriptions, clinical variations and prognostic signs leave one little to add from more recent observations. He draws attention to the importance for better or worse of the helpful interest shown by relatives and friends and of environmental influence generally in determining the prognosis. His comments on medical treatment fill the last few pages only in an otherwise fair-sized text-book. Of some interest is the fact that he recommended immersion baths, both cold and warm, for certain conditions of agitation. I notice that in a recent American text-book this form of treatment is still recommended in restless and agitated psychotic states. "Counter irritants are not much used in insanity", writes Maudsley, "although some people have rubbed croton oil into the scalp and recommended leeches to the head." Opium was much used, particularly for melancholia. Digitalis and hyoscyamus were freely used in large doses for their tranquillizing effects, the latter preferred because it was less likely to cause sudden death.

Clifford Allbutt, writing at the end of the last century, pointed out that there had always been a certain religious colouring associated with epilepsy and the psychoses. These illnesses appeared to be given special consideration, and in some way were believed to be under the direct control or influence of Almighty God. On the other hand, the neuroses, which in those days were classified under the headings of neurasthenia and hysteria, were not recognized as illnesses, but the sufferers were considered to be rather tiresome and self-centred patients, needful of sympathy and attention and able to obtain these only through illness. One might recall that this attitude followed an era of great advancement in bacteriology and pathology. Virchow wrote his great thesis, "Cellular Pathology", in 1858. It was shown that diseases which for a long time had been subject to much speculation had a simple, tangible and specific explanation. It was easy to go to the other extreme and believe that if there was no tangible pathological lesion there was no disease. Allbutt relates that in the years preceding his writing much attention has been given to these neuroses, and remarks upon the multiplicity of causation that had been attributed to them. It would seem that there was an uneasy feeling in his mind, as in the minds of many about that time, that the causation and explanation of these disorders were simply not known.

We cannot go very far in modern psychiatric reading without touching upon some reference to Sigmund Freud, the centenary of whose birth was celebrated last year. His biography is being written by Ernest Jones, who has been called a "psychoanalytical aborigine" by the American reviewer and historian, Zilboorg. Jones was also a collaborator of Freud's; he has written two volumes of the biography and a third is to come to complete the work. The second volume, published two years ago, 17 years after Freud's death, reveals something of the man. He was an intelligent, imaginative neurotic Jew. His studies commenced with his own symptoms. He suffered from fainting spells (as a result of severe emotional tension). He had a constant fear of death, and an almost constant anxiety and depressive outlook upon life. He was completely preoccupied with his work, and appeared most anxious that his theories should be accepted. In spite of his culture and writings he did not show a deep insight into the social and national tragedies of his time. Freud had faith in the success of the U-boat war and in the ultimate victory of Germany in World War I—views that might have been expressed by the ordinary citizen of Germany at that time. All this is not the picture of a well-adjusted personality; but it is a picture more human and understandable than might be gathered from his works and writings.

One of Freud's greatest contributions to psychiatry was to draw attention to the necessity for the prolonged and detailed study of each patient, laying particular emphasis upon early experiences and impressions. Early in his career he practised as a neurologist, but he is better known as the originator of modern psychoanalytical concepts. There were a great many subjects he wrote upon and many aspects of psychiatry which he studied, but I draw attention to only some of these. He laid great emphasis upon the unconscious workings of the mind, and he believed anxiety arising from conflicts over sex problems was the single most important cause of neurosis. He was a prolific and imaginative writer, and some of his most interesting communications were given in the form of lectures. Here in a relatively short period of time he would state a tentative hypothesis, then develop the subject step by step, and with what would appear to be simple logic and deduction come to some significant conclusion. When he was uncertain, Freud never failed to open his lectures with the clear statement that his presentation was tentative, that it might not be true, or that it was still subject to confirmation. However, having placated one's critical faculties in this way, he developed the idea with all the conviction of an enthusiast. Since he was covering new ground, it follows almost certainly that he was driven by some inner force that was more interested in achieving an answer than in analysing each step for truth before proceeding to the next.

During the course of his long life he had not infrequently to revise previous theories and ideas. He was subject to a good deal of criticism, but instead of discouraging him this had the effect of stimulating his imagination to greater efforts. He was a pioneer who started psychiatric thought in a new direction. His movement has not lost its impetus although, in America particularly, it has undergone considerable fragmentation of late, which probably indicates that it is in the process of losing ground. It is my feeling that the original imaginative genius knew that there were many faults in his observations and in his reasoning, but was interested to pursue his line of thought to observe what end he would ultimately reach.

However, it is different with disciples. The history of medicine shows that regression occurs when dogmatism and prejudice replace inquisitiveness, honest observation, and simple deduction. Hippocratic medicine and Galenic medicine met this same fate, and it required many centuries before Hippocratic and Galenic traditions were restored to their proper meaning.

Whatever fault one may find with Freud's theories and the emphatic conclusions born of enthusiasm, it is well to remember that he also stated:

> Because of the essential unity of the two things that we divide into somatic and psychic, one may prophesy that the day will come when the avenue from biology and chemistry to the phenomena of neurosis will be open for our understanding and we hope also for therapy.

What then is the position today, and how does it compare with the past? Speaking generally and referring particularly to the psychoses, one may say that the description of the disease and its natural history were clearly delineated by the writers of fifty years ago. There have been some refinements of classification and some rearrangements of the subdivisions of the psychoses, but these are of no great consequence. Some of the illnesses previously referred to under the heading neurasthenia would probably now be included in this group. Symptoms that previously would not have drawn the attention of the doctor are now considered of some importance because of the possible serious prognosis. However, the nature of psychosis is just as much a mystery as it ever was.

The main difference lies in different methods of handling and treating some of these conditions. Emphasis is now laid upon the study of the person as an individual, with careful inquiries into the health of his antecedents and particularly his own life history. Attention is directed particularly to circumstances which may influence in some way the later adaptation of this individual. Impressions in infancy and childhood, creating anxiety, fear and insecurity, are believed to be able to cause deviations of personality. Such variables in the capacity for adaptation may result in the formulation of patterns of behaviour which seem abnormal, unnecessary and extreme, and adjusted to a degree of insecurity which is not being experienced by the society as a whole. The object of these detailed inquiries is to determine some of the factors which have contributed to the appearance of the illness, and which it is hoped may in turn be influenced in some way and thus facilitate the recovery.

In the treatment of psychoses it would seem that the modern tendency is to remove the circumstances of physical restraint of chains and walls and instead to supply a form of chemical restraint by the use of sedation and tranquillizing drugs like chlorpromazine and reserpine. Used particularly in psychotic states, chlorpromazine has been acclaimed as opening a new era in psychiatry. The effect appears to be upon the associated tension. To the acutely restless and noisy patient it has brought some peace, the emotional drive abates and the pathological thinking process undergoes a change, and subsequently a reintegration of feeling and thought takes place. For the chronically ill patient the effect upon the illness appears somewhat different; "voices", "visions" and bizarre feelings may disappear, or no longer be a source of distress. Detached and isolated behaviour may steadily be replaced by group activities. In our present state of knowledge there is, however, no direct onslaught on the cause of the sickness. As previously, we await the natural and spontaneous remission of the illness.

There are other forms of symptomatic treatment, and included here are the various types of physical treatment, e.g. electroconvulsive therapy, which relieves depression and helps to some degree with schizophrenia. It does not in any way cure the illness, nor for that matter can one be certain that any particular illness will respond to it, or if it does, just to what degree. For instance, it has been found that the illness may respond at one stage and not at another. Electroconvulsive therapy has a useful place in the treatment of endogenous depression, and is indicated particularly if the depression is profound or prolonged. Depression is one of the most common psychiatric conditions, and is a particularly distressing illness because of the hopeless outlook and morbid thoughts associated with it, and because of the frequent preoccupation with suicide. Electroconvulsive therapy appears to lessen the intensity of the depression, and in some conditions appears to precipitate a remission. It has been instrumental in relieving suffering, keeping patients out of mental hospitals and preventing many suicides. Now it can be used in conjunction with one of the muscle relaxants given intravenously. Muscular movement is reduced and the physical strain involved in electroconvulsive therapy is reduced to a minimum, thus allowing its use in conditions with cardio-vascular limitations, bone disease, pulmonary disease or recent soft-tissue damage. The essential of this treatment appears to be the convulsion, but as yet no one has been able to determine the site and nature of its operation in reducing the effects of depression. Convulsive treatment is still extensively used after twenty years of trial.

Insulin coma therapy for a long time has been considered the chief means and most satisfactory method of treatment of schizophrenia. It requires a close association of the doctors and nurses with the patient. One doctor is limited in the number of patients he can supervise—something like a dozen is the average number. For five days a week the personal contact with and concern of the doctor for the patients under his care are quite unique in the forms of treatment that are available in most mental hospitals. Recently, some writers have suggested that the success of insulin coma therapy in schizophrenia is dependent upon the individual care and interest shown patients during the course of treatment, which may last three months or more. One therapist at the Maudsley Hospital maintains he can obtain equally good results by going through the same procedure and achieving a "coma effect" with the use of "Sodium Amytal". A well-considered investigation in 1944 by the New York State Hospital Commission contains some interesting information about the results of insulin therapy. More than eleven hundred patients treated with insulin coma therapy were matched as far as possible in all particulars with a control series obtained from hospitals not using insulin coma treatment. It was found that 60% of the untreated group and 80% of the treated group were eventually well enough to leave hospital. However, the recurrence rate was slightly higher amongst the treated group. It was also found that the average stay in hospital amongst the treated group was four months less than for those having non-specific treatment.

One should not pass over this particular aspect of psychiatric illness without referring to leucotomy and associated operations upon the brain. These procedures have had some measure of success. For a time some remarkable results were reported, then recurrences of the illness were sometimes noted. Although it is still used on occasions, this somewhat blind, irreversible and mutilating operation is reserved for special and severe cases of tension that have not been influenced by other forms of treatment. One may get some idea of the results that may be expected from the figures obtained in one large series of chronic mental hospital patients who had not responded to other forms of treatment. In this group about a quarter were recovered sufficiently well to be discharged from hospital, and another third were improved from the point of view of well-being and ease with which they could be nursed. There was a mortality rate of 5%. Someone has suggested that every patient who is relieved is one gained and a credit to this form of treatment. This may be true, but a few years ago one of the keenest exponents of this method in America was recommending leucotomy for patients whose condition had lasted six months and had not responded to other forms of treatment. This enthusiasm took no account of the natural remission likely to occur in time. Those who have to treat psychiatric illness are very conscious of the limited help that can be obtained from these forms of treatment.

The medical statistician, who may be able to decide some of the vexatious questions relevant to the usefulness of these various therapies, is confronted with the almost impossible task of obtaining two comparable groups of patients in the same stage of illness, and at the same time being able to control or even know all the factors that influence recovery or delay it.

However, it is painfully clear that these therapies have not made any conspicuous improvement in the treatment of schizophrenia. Even more disheartening is the fact that at present, with early diagnosis or the appearance of symptoms that are likely to develop into schizophrenia, we are in no position to influence directly the development and fluctuating course of the illness.

Although we are better equipped in many ways as time goes on, with more facilities at our disposal as regards both refinements of treatments and occupational and diversional interests, we in psychiatry are looking for a lead, for an idea based on some facts of observation. A lot of time and attention is given to this need by many who are interested, but the known facts of the ætiology of psychosis would scarcely fill a paragraph in a text-book of medicine.

With regard to the neuroses, the situation would appear to be rather more satisfactory. It may be summed up by saying that we have come a little way since Clifford Allbutt's time, and that the Freudian psychoanalytical concepts are accepted because there is no better theory to replace them and they have proved to be a useful working hypothesis. In a recently published American text-book, in which the Freudian concepts are faithfully reproduced, a comment in the introductory chapters draws attention to the limitations of these theories—"It will be perceived the best we have is none too good"—and exhorts the student "to do the best he can with what we have".

Because of this lack of clarity of procedure, hard words have been said about those who try to help the neurotic with his symptoms and encourage him to accept himself for what he is. The basis of the neurosis is believed to be nervous tension resulting from a conflict or a number of conflicts, arising most frequently between duty and desire, between the higher and lower aspects of our mind, between responsibility and our capacity to discharge this responsibility, between the conscious and the unconscious motives of our selves. The objective of the clinician is to help resolve this conflict, and so reduce the nervous tension and associated symptoms. This may be achieved by removing one of the causes of the conflict. Perhaps the simplest and easiest method, when possible, is to make some environmental adjustment. In this procedure the individual patient has to make no very great personal effort.

An alternative to this environmental adjustment is personality adjustment. A great deal of psychotherapy is directed to allowing the patient to review and examine his attitudes, and the factors that are associated in his mind with a particular source of tension or anxiety. This form of help is in the nature of a reeducation in values. It may be manifestly clear to the therapist that the patient's difficulties and anxieties arise from certain attitudes. However, the patient is unlikely to change his attitudes unless he realizes that they are the cause of so much stress and ill-health. To achieve this state of realization is often a long and tedious process. One consideration with which the therapist is confronted is the choice of method best suited to the particular patient.

Broadly speaking, psychotherapy is divided into two kinds, one being the adjustment primarily of those symptoms and problems which the patient at least recognizes as existing even if he does not fully understand them. The other method is directed to correcting faulty patterns of thought and feeling underlying his whole attitude to life. These particular patterns are neither present in consciousness nor immediately available for inspection. The implications of this latter concept have created some difficulty because there is no precise agreement upon what are faulty patterns of thought and what is the correct pattern. The first of these therapies is most popular because of the relative simplicity of its ambitions, and because relief from symptoms is the patient's main interest.

Some efforts have been made to try to determine which are the most effective means of treating neurosis. Some of the best known observations have come from Professor Landis of Columbia University, who in 1938 published some interesting results. At first he endeavoured to discover what was the basic amelioration rate for neurosis, i.e. he determined that with the minimum measure of skill, care and attention there was a spontaneous tendency for between two-thirds and three-quarters of neurotics to get very much better within one year. These observations were made upon patients admitted to institutions because their symptoms were fairly severe. What was more interesting was the fact that approximately this same fraction of recoveries was achieved in more energetic clinics in a much shorter period of time, namely four to six months. More recently similar studies by Professor Finesinger have indicated that over 50% of patients can be considered to have definitely improved or recovered from a particular episode, the total duration of treatment averaging 52 days. In this series the average duration of symptoms was a little over five years. Expressing this another way, one may say that in every case help can be offered and at least some degree of relief expected. No patient is beyond aid, and many remissions can be anticipated.

As clinicians we are rather inclined to see only one aspect of medicine, that particular and personal problem which is presented by our patient for our solution. Although this individual challenge must always remain as the physician's essential role, I sometimes wonder whether the greater achievements of medicine and psychiatry in particular are not on a much grander scale, namely in the sphere of human relations. The intense study of the psychological development of the individual person has built up a body of information from which some deductions have been drawn. From this material there have been positive contributions to happiness and security in childhood and adolescence, in work, in marriage, in law, in health as well as in sickness. It seems that this penetration of the tenets of mental hygiene and of good living will slowly extend further and further to all classes and ages as knowledge becomes widespread and commonplace. This slow but fruitful progress will eventually touch upon and greatly influence the earliest and impressionable years of life, the time when it appears that the seeds of neuroses are sown and our future personality and capacity for adaptation are being formed.

As matters stand at present, it is often an occasion for regret to see how anxious and insecure parents may influence a child adversely, thereby creating a state of tension and insecurity in the child, who in all likelihood will perpetuate the vicious circle. Hereditary tendencies are also involved in this family situation, and although it is impossible to assess the relative importance of each particular element, the anxious parent imposes a very great strain on a possible hereditary weakness.

To summarize the position then, the description and classification of these illnesses have become more elaborate, as might be expected with years of study. Some rearrangement of ideas has been tried with what appears to be an improvement in the general concept of illness, e.g., it is now realized that the first appearance of a psychosis may present as an acute anxiety state and may appear to remain as a neurosis for a time before more serious symptoms develop. In theory we have an explanation which we recognize as being inadequate, but because it has been helpful we still use it. It could be suggested that we are all looking in the one direction, that our appreciation and outlook are so moulded that we are finding it difficult to develop or accept for ourselves a new concept.

The theories and other studies which fill many books on our shelves are a silent reminder of past endeavours, but also of past failures. One cannot doubt for a minute that one day everything will be clear and understandable, and we would be failing in our duty if we did not continue to explore the position as we see it, and to fill more shelves with more ideas. As in the past, it seems that there is a slow maturation of medical thought which eventually will crystallize into a new idea.

One sometimes has the impression that psychiatric and psychological thinking is felt to be essentially different from the average general stream of thought. This idea is emphasized by the use of a special vocabulary, without which is it impossible to understand psychological connotations. This concept is not healthy, for the psychiatrist's words become a cloak for ignorance and deflect attention from the woeful lack of knowledge. Perhaps more seriously it conveys a complacency of mind on the part of both the teacher and the student, whereas the opposite should be the case, namely to learn the known facts of the natural history of the illness and develop an inquisitive attitude of mind, in the knowledge that some happy combination of thought one day will open an entirely new approach.

Helen McLean, who is quoted in "Practical Clinical Psychiatry" by J. R. Ewalt and others (1957) as presenting one aspect of today's problem, states:

> Over 50 years of investigation have made it clear that the total personality of any human being is a socio-psycho-biological complex. The complexity of interrelationship between forces in personality and forces in environment is so great as to be almost beyond comprehension.

This bears a striking resemblance to Sydenham's synopsis, namely "the cause of the majority of diseases is inscrutable and inexplicable".

With reference to treatment it may be said that we have a much better understanding of influences, both advantageous and detrimental, which modify the mental state. To some extent we are aware of our limitations, and we still depend heavily upon the natural tendency of many of these illnesses to remit spontaneously.

As has been said, there are many possible fields of psychiatry that one could review on an occasion such as this; my particular interest is in clinical psychiatry, and in consequence my particular exhortation is to the clinician.

The purpose, if there must be one, of this paper is to draw attention to the limited progress we have made over the centuries, in spite of screen and Press indications to the contrary. It would serve a useful purpose if all our medical practitioners realized that the tenets of psychoanalysis are used with a realization of their inadequacy, and that psychological medicine is in grave need of new concepts. And if it happens that we cannot contribute in any major way by the addition of new concepts, we can at least contribute observations from our experience—those ideas and theories that we have found helpful.

And to this purpose may I be excused if I conclude with another reference to Sydenham, who states:

> With the medical man—his province is to cure disease and to do naught else . . . Wise and learned then as he may be, he will do no real good in medicine who instead of investigating the occult and tortuous methods whereby

Nature evolves disease, instead of studying their history and instead of putting forth his whole strength to the adaptation of remedies, wearies his brain with curious and irrelevant speculations. It makes medicine the art of gossiping rather than the art of healing.

THIRTY YEARS OF JUVENILE RHEUMATISM.[1]

By LAURENCE HUGHES,
Sydney.

EARLY in the eighteenth century, Henry Fielding wrote in "Tom Jones": "Every physician almost hath his favourite disease." If the word favourite is used in the sense of something which is regarded with special preference, this is perhaps one reason for the title of this short address. However, a more cogent reason is that, although there has apparently been a world-wide decline in the incidence of juvenile rheumatism, the cause of the disease remains unknown, and it continues to demand the attention of pædiatricians and public health and research workers. The term juvenile rheumatism, originally introduced by Miller some years ago, is retained in preference to either rheumatic fever or acute rheumatism. The disease is predominantly one of childhood, and in its insidious form the seeds of subsequent cardiac disease may be sown without acute symptoms or febrile disturbances.

In a recent number of the *British Medical Journal*, Sir Henry Dale, in an article on "Medical Treatment", writes as follows:

> However strong and general might have been a desire for a rationally based therapeutic practice . . . the physiological and pathological knowledge required to provide such a basis did not really begin to become available till the later decades of the nineteenth century. We could claim indeed for its final ten years, the 1890's, a very special share in the inauguration of a new therapeutic era the ever more rapid development of which we are now watching with an excitement verging perhaps on bewilderment.

Some of us were born in this epoch-making decade, and early in the second decade of the present century graduated in medicine. We learned with absorbing interest of some of the then recent discoveries and advances in medicine. X rays were discovered in the nineties, and about the same time the mosquito-malaria hypothesis was proven. Effective treatment against syphilis with arsenical preparations was introduced in 1910. The first edition of MacKenzie's "Diseases of the Heart" was published in 1908—a work which not only gave us a better understanding of rheumatic heart disease, but also played an important part in the foundation of modern cardiology.

First Decade.

My interest in juvenile rheumatism began in the middle 1920's, as a result of a relatively high incidence of the disease at the time in private practice, and of my association with the Royal Alexandra Hospital for Children. What was the position in regard to the disease at this time and for the subsequent decade? It was recognized, as it had been for years before, as a public health problem of considerable importance, and as ranking high as a cause of disabling heart disease. It was seen clinically in the more classical and easily recognized acute form, but also commonly in the more difficult and possibly more dangerous insidious form, to which reference will be made later. The ætiology was unknown, though by this time the importance of bacterial infection together with some other factor was stressed. Poynton wrote:

> No one is a firmer supporter of the belief of infection as a factor than I am, and I venture to think no one is less convinced that mere infection is the sole explanation of this disease.

Treatment consisted of rest in bed for a minimum period of six weeks, the administration of adequate doses of salicylates, regular observation of the cardiac status, and measures to improve the patient's general health and resistance. Regular observations of the patients were subsequently made for long periods for signs of recrudescence of the disease, and the children were protected as far as possible from respiratory infections.

Second Decade.

To pass now to the second decade, which includes the first half of the 1940's—this covered a period of remarkable therapeutic achievement in regard to bacterial infections. The first of the sulphonamide drugs was discovered in 1935, and was followed by a long list of others. Within five years, many of the acute infections were being successfully treated by the "wonder drugs". It was during this time also that research, especially associated with the name of Coburn, indicated that although streptococci had long been suspected of playing a part in the ætiology of juvenile rheumatism, group A hæmolytic streptococcal infections of the upper part of the respiratory tract frequently preceded both initial attacks of the disease and also recrudescences. As this organism was sensitive to the sulphonamide drugs, it was reasonably thought that they might be a useful adjunct to the treatment of juvenile rheumatism. However, in the active stage of the disease, the administration of these drugs was found to be definitely contraindicated; but their use as a prophylactic measure aginst recrudescence has been of great value.

Close upon the heels of the sulphonamide drugs came the development and use of the first of the antibiotics, penicillin, which had been discovered 10 years previously. This was given impetus by World War II, and opened up the ever-increasing field of antibiotics as we know it today. The group A hæmolytic streptococcus was found to be sensitive to penicillin, which had a bactericidal action upon the organism, as opposed to the bacteriostatic action of the sulphonamides. It was then anticipated that penicillin would be a more effective therapeutic agent in the treatment of the disease. This has been amply proven, and the first essential in the treatment of a patient with an attack of acute rheumatism is to give adequate penicillin therapy parenterally as soon as the diagnosis is made and for a period of a week or ten days. As with the sulphonamides, continued daily administration of penicillin by mouth over a long period as a prophylactic measure is proving very satisfactory.

Constitutional Factors.

It is as well at this stage to record that during the two decades so far considered, in addition to the search for and the treatment of an infective factor in the ætiology of juvenile rheumatism, a great deal of attention had been paid to possible constitutional ætiological factors in the patients themselves—for example, hereditary susceptibility and familial tendency to the disease, socio-economic factors, nutritional and hygienic standards. Poynton had stressed the undoubted association of repeated attacks of chorea with the gradual development of mitral stenosis, and from this occurrence in the unduly nervous, emotionally unstable child propounded the suggestion of "nerve strain as a factor in lowering the resistance not only of the brain but of other parts of the body to acute rheumatism". He also strongly supported the establishment in Britain of homes for the specially supervised prolonged convalescence and subsequent supervision of children with juvenile rheumatism along the lines of those already in existence in America. In 1933 the Smith Family established the first unit of this kind in Australia, in one of the hill districts of Sydney. Mount Arcadia Recovery Hospital has served a very useful purpose since its inception. With the help and support of the Hospitals Commission of New South Wales, the original building was replaced several years ago by a modern, well-equipped, 60-bed unit at a cost of £65,000. During the latter half of last year the Board of the Smith Family decided, in keeping with similar happenings overseas and as a result of a decline in the incidence of juvenile rheumatism, to change the hospital as originally

[1] Presidential address, delivered at a meeting of the Section of Pædiatrics, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

instituted, and transfer its use to the care of elderly people. During its 22 years as a recovery hospital, over 1000 children received efficiently supervised convalescent care in it. The majority of these showed marked improvement, and a far greater tendency to escape recrudescence or permanent cardiac disability than others not so fortunate.

Third Decade.

During the third decade of this review, the most important single happening was the discovery of cortisone in 1949, and its promising use as a therapeutic agent in juvenile rheumatism. Although later reports have not sustained these earlier hopes, the full story of cortisone and allied hormones is probably yet to be told, and one anticipates the future development of these preparations, which may be more effective and less liable to undesirable side-effects. At this stage it may be said that there are occasions when cortisone plays an important and perhaps life-saving part in the treatment of severe forms of the disease. However, as routine therapeutic agents in most instances penicillin and the salicylates may be regarded as the sheet anchors.

Discussion and Conclusion.

No pretence has been made of any new or original thought in this address, the subject matter of which has benefited by the impact of renewed interest and research during the past twenty years. However, as with research and progress in all fields, it is a truism that strands of continuity run unbroken through all the years of change, and clinical experience gained from the opportunity of following many patients with this malady through the pædiatric period into adult life has been both helpful and interesting. There can be little doubt that the most important individual events of recent times in regard to juvenile rheumatism have been the proof of the association of preceding streptococcal infection with the subsequent onset of acute rheumatism and the discovery of an antibiotic which is lethal to this infection. Penicillin therapy at the onset of an attack or a recrudescence has undoubtedly been largely responsible for the decline in the incidence of this disease in recent years. But streptococcal infections are common in childhood, and acute rheumatism is comparatively rare. There must be some other factor or factors as yet unknown, probably in the patients themselves, which play a part in the ætiology of the disease, and future research must continue along these lines. An allergic factor in some way associated with the group A hæmolytic streptococcus is most widely favoured at the present time. This presupposes an antigen and antibody at present entirely hypothetical—as is also the suggestion that tissue protein which has been altered by streptococcal infection is antigenic.

As in other types of infection, there is considerable evidence of genetic susceptibility to this disease, a factor which is perhaps not always sufficiently stressed. In a paper published in *The Lancet* in 1945, Pickles reported a rheumatic family, in which a man with rheumatic heart disease had 53 descendants, 23 of whom had rheumatic fever or unmistakable signs of mitral stenosis. Socio-economic factors still deserve attention, and I am of opinion that progressive improvement in social conditions has contributed to the decline in the incidence of juvenile rheumatism, although a recent survey by the Institute of Child Health in Sydney does not appear to support this view.

With regard to other problems which arise, the early detection of the insidious or "sub-clinical" form of the disease is a difficult one. In my experience over the years, this type of rheumatic infection has been common. The child who presents symptoms of vague ill health and minor symptoms suggestive of rheumatic infection should be under suspicion and subjected to regular surveys. There is little doubt that the children who in later life present for the first time with established rheumatic carditis, and in whom a careful history fails to reveal any indication of a previous acute attack, have been the victims of this insidious form of the disease.

In conclusion, it may be said that although there has been a definite waning in the incidence of juvenile rheumatism for several years, it cannot be assumed that this decline will continue, especially in view of the fact that the cause of the disease is not yet known. However, a plea is made for the full use of the helpful knowledge already gained in regard to the infective factor by adequate penicillin therapy at the onset of an acute attack, by the use of salicylates and by an adequately supervised prophylactic course of penicillin or sulphonamides at hospital, clinic or home for the subsequent five years.

ANOTHER LOOK AT THE PROBLEM OF LUMBO-SACRAL PAIN AND SCIATICA.[1]

By THOMAS KING,

Honorary Orthopædic Surgeon, St. Vincent's Hospital, Melbourne.

THE invitation to speak on the subject of lumbo-sacral pain and sciatica was made by the committee of the Section of Orthopædics because F. P. Morgan and myself had published a paper (1957) in which a conception—first proposed by Knutsson (1944)—of this difficult and often puzzling problem was put forward; moreover, it was one that had not been widely accepted or perhaps generally known, except in northern Europe. Attention was directed to an early form of intervertebral disc degeneration that resulted from injuries to the lamellæ that constituted the annulus fibrosus. These injuries caused incomplete rupture of the annulus by radial or horizontal tears and concentric slits or fissures in the lamellæ, and thereby differed from a complete rupture of the annulus, in which all the lamellæ are torn across, with the result that rupture, protrusion or posteror herniation of the nucleus pulposus or degenerated disc material was the result. These incomplete tears of the lamellæ or annulus had been described by Luschka (1859) and again by Schmorl (1932), and are both easily and commonly observed in spinal autopsies. Knutsson suggested that this early type of disc degeneration was the cause of so-called primary vertebral instability, which could be demonstrated by radiographs. This was proved by Friberg (1948) and others, who showed by spinal necropsies that whenever there were pronounced changes in the disc, such as lamellar tears, as described by Schmorl, corresponding instability could be shown in the spine by post-mortem radiographic examination. Lindblom, in the same year, conclusively showed these lamellar tears and fissures by radiographs after injecting an opaque medium into the discs.

The object of this paper is to show that early and "incipient" disc degeneration may be present long before there are the usual and easily recognized radiological signs of gross disc degeneration, such as a distinct narrowing or reduction in the height of the intervertebral disc space, sclerosis of the upper and lower bone margins of the vertebral bodies (epiphyseal rings), gross osteophytic spurs and degenerative changes in the apophyseal joints.

It seems logical, in view of the frequency of these lamellar injuries as seen in spinal necropsies, that they would not only cause pain (described later), but that they might perhaps be the commonest cause of lumbo-sacral pain in the third to fourth decades of life in those cases in which the cause lies in the vertebral column. Doubtless there are other, but unproven, causes of lumbo-sacral pain that arise from injuries to the muscles, ligaments, etc.; but they do not at the present time appear to have the importance that for too long has been attributed to them. Such explanations for backache are being gradually abandoned, although their existence cannot be entirely excluded. Other important causes of lumbo-sacral pain and sciatica that lie outside the vertebral column, such as pregnancy, pelvic tumours, carcinoma of the prostate

[1] Presidential address, delivered at a meeting of the Section of Orthopædics, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

and the pancreas, aortic aneurysms, etc., are easily excluded by their obvious clinical features.

Anatomical Considerations.

The disc is not a simple structure. Each individual disc constitutes the main joint between two vertebral bodies. The joint cavity is represented by the highly elastic and fluid nucleus pulposus. The 10 to 12 lamellæ of the annulus fibrosus may be compared to the capsule of a normal joint, and resemble an onion in horizontal sections. The apophyseal joints bear little weight, their function being to limit rotation, flexion and extension. The vertebral bodies and discs bear the greater part of the stress and strain. This means that each disc, especially in the lumbar region, is under a great trial of strength over the many years for which an individual is spared to use the spine. "Changes which would in other organs be interpreted as advanced degenerations occur in the intervertebral discs with surprising frequency, and seem to set in at a comparatively early age." (Beadle, 1931.)

The upper and lower bone surfaces of the vertebral body are not covered by end plates of compact bone as in normal joints. The only compact bone is the narrow epiphyseal ring at the periphery of the bone surface, and this is only two to four millimetres broad and about two millimetres above the general level of this surface. Lying within this peripheral ring of compact bone is the perforated spongy bone of the vertebral body. This spongiosa bone is covered by a tough layer of true hyaline cartilage, which prevents the nucleus pulposus from herniating into the spongiosa bone. Although these cartilaginous plates are known to have great powers of resistance to the effects of mechanical forces, Schmorl noticed jagged tears, "*Blitzfiguren*", in these in rather more than half the subjects examined at necropsy. The disc, having no blood supply, depends upon diffusion of "foodstuffs" through these cartilaginous plates from the highly vascular spongiosa of the vertebral body, and because of this method of nutrition "the intervertebral disc shows perhaps a stronger inclination to various forms of degeneration in advancing age than any other tissue in the body" (Beadle, 1931).

The smallest tears in the cartilage plate affect the permeability and alter the sensitive osmotic balance and dehydration of the nucleus pulposus. Thereby the nutrition of the whole disc is affected.

Although the disc as a whole has no nerve supply, this does not imply that injury to the disc with tearing of the lamellæ is painless. Again, when the cartilage plate is torn or split, the spongiosa bone of the vertebral body is exposed, and this of course has a rich nerve supply. When the annular fibres are torn close to their peripheral attachment to the vertebral body margins, the sensitive periosteum is injured. The ligaments attached to the discs have a nerve supply, and this is especially rich in the case of the strong and thick anterior common ligament, which is firmly attached to the annulus. The posterior common ligament is weaker, but has a nerve supply from the recurrent nerve, which is derived from the nerve root that is one to two vertebral levels more proximal to the disc that it supplies (Roofe, 1940).

Pathological Anatomy.

Schmorl and Junghanns, in their thousands of spinal necropsies, in which the whole spine was removed by "laboratory servants" in five to seven minutes, observed 23 specimens of what they called "pseudo" spondylolisthesis in lumbar vertebræ. This term was used to distinguish this listhesis from that taking place when there was a defect in the neural arch (pars interarticularis), which naturally predisposed to slipping of one vertebral body upon another, as in so-called true spondylolisthesis. Some authorities consider that the terminology should be reversed, whilst J. S. Barr (1957), speaking at a meeting of the Boston Orthopedic Society, thought that both conditions should be named spondylolisthesis, one with, and the other without, an intact neural arch. The malady that Junghanns had described from observations in necropsy specimens was the same as that described by Knutsson on radiographic evidence; he observed the sliding that took place between two lumbar vertebræ, on comparing lateral views in extension and flexion. Knutsson thought the cause was the various tears and fissures of the disc that had been described by Schmorl; but it remained for Friberg (1948) to prove this by pathological studies. He examined 100 spines and 500 lumbar discs (most from subjects between the ages of 20 and 50 years), including the attached sacrum, which was fixed in a vice, and lateral radiographs were then made in the positions of both flexion and extension. In all the specimens in which post-mortem instability was shown radiographically, he was able to demonstrate by horizontal knife section of the discs at that level the usual tears, splits and fissures of the disc that had been described by Luschka and later by Schmorl. Thereby he confirmed Knutsson's suggestion that the radiological demonstration of instability of lumbar vertebræ was a radiological sign that indicated early disc degeneration of the type caused mainly by injuries and tears of the annulus. H. Crock (1956) repeated this work when he was the orthopædic registrar at St. Vincent's Hospital, Melbourne.

If the injury to the spine is severe enough on the first occasion to rupture completely the 10 to 12 lamellæ that constitute the annulus fibrosus, we have a nucleus pulposus herniation. But more often the final and complete rupture of the lamellæ is the result of many incomplete radial tears that begin near the nucleus and pass posteriorly. The material in this instance is composed partly of degenerated nuclear material and frayed pieces of the torn lamellæ. This material protrudes into the neural canal and may still have a covering or capsule of the stretched and expanded peripheral lamellæ.

With regard to the incomplete ruptures of the lamellæ in which there is no true posterior herniation, they are commoner in the posterior lamellæ, because these are weaker than the anterior lamellæ. In the upper lumbar vertebræ these tears are crescentic and cause fissures or slit-like spaces between the lamellæ. In the two lowest discs the tears are radial (cutting across the lamellæ), and after passing posteriorly from the nucleus they may continue laterally and terminate in front of the intervertebral foramen, where nerve root irritation can be caused from bulging of the weakened disc. Again, the radial tear may pass posteriorly in the direction of the centre of the posterior common ligament, and thereafter branch laterally in "inverted T" form.

Any tearing of the cartilaginous plate can result in bleeding from the spongiosa bone into the fissures and splits of the lamellæ. These old hæmorrhages into the disc later result in blood pigmentation ("*braune degeneration*" of Schmorl).

Clinical Features of Early Disc Injury and Degeneration (Lumbar Instability).

Age, Sex and Occupation.

Most of those affected are aged between 30 and 50 years, and male; only about half do heavy manual laboring work. The condition is common amongst men who do heavy and unaccustomed work. It is rare between the ages of 20 and 30 years. The pain associated with the malady appears to diminish after 50 years, unless there is an acute injury causing further damage to the disc. Gross disc degeneration seen in radiographs of older patients, and unaccompanied by pain, is well known; but this observation does not justify the argument that early disc degeneration, that is implied by the observation of lumbar vertebral instability in lateral radiographs, is not a cause of lumbo-sacral pain and sciatica. These critics would hardly deny that epigastric pain was caused by a duodenal ulcer that had been shown to be present by radiographs. Furthermore, a duodenal ulcer may be present and cause no pain until there is a perforation.

Onset.

Usually there is a fairly long history of chronic lumbo-sacral pain, with intervening acute attacks. As a rule the onset is neither as acute nor as painful as when the

nerve root is irritated by a posterior herniation of a portion of the disc.

Neurological Signs.

Sciatica is frequent, and usually is unaccompanied by neurological signs; but if they are present, these are minimal compared with those from the irritation caused by a protrusion into the neural canal. It is unaffected by coughing or sneezing, etc.; straight leg raising does not cause sciatic pain, but it may cause pain in the lumbo-sacral region; and spinal rigidity, scoliosis and loss of the ilio-lumbar curve are rare. These are important clinical features that help to distinguish between these rather similar maladies.

The sciatic pain rarely passes down to the foot, and it is not so accurately localized as in posterior disc herniations. Abdominal pain—usually in the lower part of the abdomen and the inguinal regions—is fairly common. This arises from an injury to the anterior part of the annulus where the anterior common ligament is close to the torn lamellæ, because this ligament has a rich nerve supply, which is relayed to the anterior and peripheral attachments of the annulus. As has been already mentioned under the heading of "Anatomical Considerations", this peripheral nerve supply to the disc is derived from a nerve root that is proximal by two segments. For the same reason, in the "fourth nerve root syndrome", one of the symptoms is pain in the adductor and hip regions (referred from the second nerve root segment).

Cause of Pain.

A posterior radial tear that cuts across most of the lamellæ leaves the intact peripheral lamellæ weak. The tear may now extend laterally, causing the "inverted T" tear, the lateral extensions of which end in front of the intervertebral foramen. The disc now bulges posteriorly and can irritate the nerve root. Posterior sliding of more than 2·5 millimetres of an upper vertebral body on the one immediately below can cause compression of the nerve root by the posterior margin of the cranial vertebral body and the superior articular process of the lower vertebra (Friberg). Schmorl showed that the so-called persistence of epiphyseal centres at the margins of the vertebral bodies was erroneous, and really was the result of marginal fractures of the compact bone that replaced the former epiphyseal rings. These posterior marginal fractures can cause the formation of osteophytes or ununited spicules of bone, which encroach upon the the intervertebral foramen and thereby are capable of causing nerve-root irritation. The instability in itself has a dragging effect upon the anterior and posterior common ligaments, which have a rich nerve supply, and also on the interspinous and other ligaments. If the hyaline cartilaginous plates are torn, the exposure of the sensitive bodies of the vertebræ can contribute to chronic backache. In the same manner, a severe injury with the tearing of the sensitive periosteum where the attachments of the peripheral part of the annulus fibrosus have been injured appears to be one of the causes of acute episodes of pain. All these types of injury have been shown by spinal necropsies.

X-Ray Examination.

An early indication of disc degeneration is a slight receding of or a "rounding" of the anterior margins of the vertebral body with slight sclerosis. This is caused by the abnormal mobility of the annulus on the underlying lumbar vertebra. Slight marginal spurs and small or "minimal" osteophytes (perhaps thought hardly worthy of being reported) are caused in the same way; and also marginal fractures of the epiphyseal bone rings may arise from strains and tears affecting the attachments of the peripheral lamellæ.

Tears and fissures on the annulus can be clearly shown by discography. If the disc is normal, only about 0·5 cubic centimetre of water-soluble dye can be forced into the intervertebral disc space, and the dye is confined to the region of the nucleus pulposus, which is rendered opaque and shaped like a cherry. But if the annulus has been torn, 3 cubic centimetres or more can be easily injected, and the dye diffuses immediately into the fissures of the injured annulus. The method is impressive and important, and is a radiological confirmation of the pathological studies of Friberg and Hirsch (1949), who found that instability was a radiological sign that implies early disc degeneration.

Radiological examinations of function include the following.

Testing for Antero-Posterior Sliding or Instability.

This is Knutsson's method. Lateral radiographs are made with the patient in the vertical position (either sitting or standing), in forced extension and then in flexion. There is little extension in the lumbar part of the spine, and most of this takes place at the fourth to fifth lumbar vertebral level. Flexion is slight, and really consists in eliminating the ilio-lumbar curve. Knutsson assumed that the vertebral body resting on a healthy disc was stable, but not if the disc was degenerated. However, sometimes—and infrequently—in very active individuals there may be one or two millimetres of antero-posterior sliding. This is normal; but displacements above two millimetres are abnormal, in the lumbar region. However, in the cervical region not only is it normal for the fourth or fifth vertebral bodies to slide forwards on full flexion of the neck, but a slight subluxation also appears to take place. This may cause mistakes in diagnosis, with legal implications such as claims for damages, after an accident, when the neck in point of fact is normal. This normal instability between the fourth, fifth and sixth cervical vertebræ doubtless is the explanation why secondary disc degeneration is so commonly met with at those sites later in life.

When there is instability between the levels of the first to the fifth lumbar vertebræ, the vertebra proximal to the degenerated disc moves backwards on hyperextension (retroposition or the posterior pseudo-spondylolisthesis of Junghanns). In such a case, when the radiograph is then made with the lumbar part of the spine in flexion, the proximal vertebra now moves forward and the retroposition is corrected; but in many cases there may now develop an anterior displacement (the anteroposition or anterior pseudo-spondylolisthesis of Junghanns). Although instability from early disc degeneration is rare at the fifth lumbar to the first sacral level, if it appears, the fifth lumbar vertebra tends to pass forward on extension, which is the reverse displacement to that which takes place in the proximal vertebræ on extension. This instability is as a rule possible only between the first and fifth lumbar vertebræ, because in the presence of a degenerated disc the articulating surfaces of the superior and inferior articular processes look outwards and inwards (parasagittal plane), thereby offering no bony block to antero-posterior sliding. Admittedly, individual variations may affect the anatomical disposition of the facets. But the articular facets between the fifth lumbar and first sacral vertebræ look forwards and backwards (coronal plane) as a general rule, and thereby are a solid bony resistance to the antero-posterior sliding, unless there are gross disc degeneration and secondary changes in the apophyseal joints; and only in the presence of gross disc degeneration at this level in about half the cases can instability be demonstrated (Knutsson). Notwithstanding, instability between the fifth lumbar and first sacral vertebræ is sometimes incorrectly reported when there are no gross disc changes. This mistake has been described as an optical delusion (Willis) or as a fallacy brought about because the antero-posterior diameter of the fifth lumbar vertebra may be three to five millimetres longer than the corresponding surface of the first sacral vertebra in an otherwise normal lumbo-sacral junction. This error is avoided by measuring with a dividing calliper the antero-posterior diameters in a lateral radiograph.

Estimation of Instability.

The posterior margins of the vertebral bodies may be traced by marking their edges with a greased pencil at the corresponding intervertebral disc levels. The amount of instability is measured by the width of the step in the "staircase effect" caused by the antero-posterior sliding.

Instability between the fourth and fifth lumbar vertebræ is by far the commonest site, because this is the region in the lumbar part of the spine where the greatest amount of movement takes place. It is unfortunate that instability (thereby implying early disc degeneration) cannot, as a rule, be demonstrated between the fifth lumbar and first sacral vertebræ, because of the disposition of the articular facets. This is a common site for gross disc degeneration later in life.

Decrease in the Height of the Intervertebral Disc Space by Functional Radiographs.

The following observations were made by Hasner *et alii* (1952).

1. A normal disc can "open up" anteriorly on extension of the lumbar part of the spine, but it cannot be "narrowed" or compressed significantly by flexion or extension, either anteriorly or posteriorly. If the intervertebral disc space is diminished in height, in front by forced flexion or behind by extension (by comparison with other intervertebral spaces), we can assume that there is early injury with disc degeneration in either the anterior or the posterior lamellæ of the annulus fibrosus, respectively.

2. In the normal lumbar spinal area, the height of the discs is the same whether the patient is radiologically examined in either the vertical or the reclining positions, because the normal disc is not easily compressed. A decrease beyond 5% is significant of an abnormal disc.

Altered Angulations between the Intervertebral Discs on Sideways Bending.

These are seen in antero-posterior radiographs. Normally a line drawn through the upper and lower surfaces of a disc should meet at an angle on the concave side of the curve on sideways flexion or bending. If the lines remain parallel or even meet on the convex side (paradoxical), the disc is abnormal (Hasner *et alii*, 1952).

The "Vacuum" Phenomenon.

The "vacuum" phenomenon (Knutsson) does not appear to be a common phenomenon. With hyperextension of the spine there is a lowering of tension within the disc in the front. If there are fissure spaces from injury to the annulus, a vacuum is formed in them. Gas from surrounding tissues now enters these spaces. Air shadows can then be seen in the intervertebral space, according to Knutsson; but on flexion of the spine these vacuum spaces are compressed and no longer is an air shadow shown.

Warning.

In all these functional radiographs the distance of the target should not be short, the centring should be accurate, and the patients should be in the vertical position for the lateral radiographs, because lying on the side not only causes rotation of the spine, but in the case of the wide pelvis also causes lateral flexion, thereby rendering a true lateral radiograph impossible.

Difficulties in Diagnosis and Treatment.

Obviously mistakes could be made, on clinical and radiological grounds, in correctly distinguishing between complete posterior rupture of the lamellæ of the annulus fibrosus (causing rupture of the nucleus pulposus) and an incomplete rupture of the lamellæ, on the first occasion (and this is the important point) when either took place. The diagnosis of a complete rupture would be suggested if coughing, etc., increased the pain, if the spine was rigid and if loss of the lumbar curve and neurological signs were present. In such a case the X-ray examination would be delayed until pain had subsided. It would then show in either case, as a rule, instability between the two vertebral bodies at the site of disc injury, for instability is just as common with a complete as with an incomplete rupture of the lamellæ of the annulus. At this stage neither a discogram (reliable) nor a myelogram (not so reliable) would be justifiable. Whatever the diagnosis, the treatment should be conservative—rest—because perhaps over 90% of patients recover.

With regard to that very important group of patients with the complaint of chronic lumbo-sacral pain interspersed with acute attacks, the clinical distinction between those with complete and incomplete ruptures of the lamellæ of the annulus can be made with some reasonable accuracy for the reasons already given. Neurological symptoms and signs suggest a complete rupture. The neurological signs are not gross in the incomplete injuries to the annulus; often they are absent. In the past, patients were submitted to operation on account of the complaint of lumbo-sacral pain although they might not have had any neurological signs. The myelogram might have shown no posterior protrusion, or indeed no myelogram might have been taken. Too often, to the disappointment of all, no protrusion was found. If, then, the surgeon did not recognize the importance of lumbar instability, easily noted at operation, and the fact that it indicated a special form of disc degeneration caused by incomplete tears and fissures in the annulus, the operation was concluded without the performance of a spinal fusion. I learnt the importance of lumbar instability from F. P. Morgan.

Finally, there are those patients who have not responded to conservative treatment, and desire relief from intractable pain. These patients are hand-picked before being submitted to operation, especially if compensation is involved. Both F. P. Morgan and myself hold the view that these should have a discographic or myelographic examination before operation. The discogram will show whether the annulus is completely or incompletely ruptured. It will certainly demonstrate whether the disc is a normal one. The myelogram is reasonably reliable in showing whether there is a posterior protrusion.

TABLE I.

Diagnosis and Spinal Fusions in 1000 Patients with Lumbo-Sacral Pain.[1]

Cause.	Number of Cases.	Spinal Fusions.
Unstable lumbar vertebræ	277 (27·7%)	27
Gross disc degeneration (fourth and fifth lumbar and first sacral vertebræ)	213 (21·3%)	8
Posterior protrusion of degenerated disc material	135 (13·5%)	25
Spondylolisthesis	99 (9·9%)	13
Multiple disc degeneration (spondylosis)	92 (9·2%)	—
Other causes	47 (4·7%)	—
Senile osteoporosis	33 (3·3%)	—
Old fractures	30 (3·0%)	—
Functional	24 (2·4%)	—
Tuberculosis	20 (2·0%)	2
Ankylosing spondylitis	17 (1·7%)	—
Tumours	13 (1·3%)	—
Total	1000	71 (7·1%)

[1] The data in this table may be analysed as follows: (i) 71 spinal fusions in 1000 patients with lumbo-sacral pain from various causes (7·1%); (ii) 27 spinal fusions in 277 patients with unstable lumbar vertebræ (9·7%); (iii) 25 spinal fusions in 135 patients with posterior protrusion of degenerated disc material (18·5%); (iv) 13 spinal fusions in 99 patients with spondylolisthesis (13·0%); (v) two spinal fusions in 20 patients with tuberculosis; (vi) eight spinal fusions in 213 patients with gross disc degeneration between the fourth and fifth lumbar vertebræ, or the fifth lumbar and first sacral vertebræ (3·75%).

In 90% of cases in which incomplete rupture of the annulus has been diagnosed, the appropriate treatment is rest in bed for acute attacks and the use of the spinal brace for about three months thereafter (see Table I). This restriction of spinal movements allows the injured disc an opportunity to heal. It is logical, taking into account the pathology of the lesion, to regard active physiotherapy, spinal exercises "to strengthen the muscles", or spinal manipulations, especially under anæsthesia, as likely to do more harm than good.

If patients are examined after one or two episodes, a complete recovery can be expected. But they should be taught to "lift with the knees" in future and not with the flexed spine. In long-standing cases, complete relief from attacks of lumbo-sacral pain usually follow rest and the use of a spinal brace; but such patients should be advised against resuming heavy manual labour that causes stress

and strain on the back. With regard to those workers' compensation patients who have no desire to work again, which is fortified by the looming up of a "lump sum", and who are aware (as are their lawyers) that there is evidence of early disc degeneration as shown by lumbar intervertebral instability, we can only await the inevitable settlement.

Conclusion.

The proof of the proposition that the demonstration of instability in the lumbar part of the spine by radiological examination indicates early disc degeneration (that is, before there is gross evidence such as narrowing of the intervertebral space, sclerosis of bone, osteophytes and secondary degenerative changes in the apophyseal joints), relies on the following evidence:

1. Schmorl described a special form of injury to the discs, in which there were tears across the annulus that were incomplete, leaving the peripheral lamellæ intact (1932).

2. The pathological studies of Schmorl and Junghanns showed listhesis (but no neural arch defects) and disc degeneration in 23 specimens removed at necropsy (1932).

3. Friberg's pathological studies of spines that were removed at necropsy and then radiologically examined for instability by the Knutsson "functional" technique (1944) showed that, whenever instability could be demonstrated between two vertebræ, examination of the corresponding disc showed fissuring and tearing of the lamellæ (1948).

4. Discograms (Lindblom, 1948) show interlaminar fissures and laminar tears, etc., when instability is present.

5. Twenty years ago lateral radiographs were often taken with the patient in the vertical position, and although radiographs in the two positions of flexion and extension were not taken, it is sometimes possible to review the old radiographs and to trace small posterior displacements, especially between the fourth and fifth lumbar vertebræ. Some of these patients have been examined in recent years, and signs of gross disc degeneration are now obvious (Morgan and King, 1957).

6. Secondary instability can often be demonstrated whenever the disc between two vertebræ is grossly affected by disease or injury—for example, tuberculosis, multiple disc degeneration (formerly called osteoarthritis or spondylosis), gross disc degeneration between the fourth and fifth lumbar vertebræ, or the fifth lumbar and first sacral vertebræ, and in many cases of posterior herniation of the nucleus or degenerated disc material, etc. Therefore it is not illogical to expect that the early forms of disc degeneration resulting from incomplete tears and fissures in the lamellæ of the annulus fibrosus may cause the so-called "primary instability of lumbar vertebræ"; and it is this form of instability, and the implied "incipient disc degeneration", that has been dealt with in this paper.

References.

BEADLE, O. A. (1931), "The Intervertebral Discs. Observations on their Normal and Morbid Anatomy in Relation to Certain Spinal Deformities", Medical Research Council of the Privy Council, Special Reports Series No. 161, H.M. Stationery Office, London.

FRIBERG, S. (1948), "Anatomical Studies on Lumbar Disc Degeneration", *Acta orthop. scandinav.*, 17: 224.

HAGELSTAM, L. (1949), "Retroposition of Lumbar Vertebræ", *Acta chir. scandinav.*, Supplementum 143.

HASNER, E., *et alii* (1952), "Degeneration of Lumbar Intervertebral Discs", *Am. J. Phys. Med.*, 31: 442.

KNUTSSON, F. (1944), "The Instability Associated with Disk Degeneration in the Lumbar Spine", *Acta radiol.*, 25: 593.

KOHLER, A., and ZIMMER, E. A. (1956), "Borderlands of the Normal and Early Pathologic in Skeletal Roentgenology", 10th Edition, Grune and Stratton, New York and London.

LINDBLOM, K. (1948), "Diagnostic Puncture of Intervertebral Disks in Sciatica", *Acta orthop. scandinav.*, 17: 231.

ROOFF, P. G. (1940), "Innervation of Annulus Fibrosus and Posterior Longitudinal Ligament", *Arch. Neurol. & Psychiat.*, 44: 100.

MORGAN, F. P., and KING, T. (1957), "Primary Instability of Lumbar Vertebræ as a Common Cause of Low Back Pain", *J. Bone & Joint Surg.*, 39-B: 6.

SCHMORL, G., and JUNGHANNS, H. (1953), *"Die gesunde und die kranke Wirbelsäule im Röntgenbild und Klinik"*, 3rd Edition, Thiem, Stuttgart.

WILLIS, T. A. (1935), "Backward Displacement of the Fifth Lumbar Vertebra: An Optical Illusion", *J. Bone & Joint Surg.*, 17: 347.

SOME PROBLEMS OF LUNG CANCER—A PHYSICIAN'S VIEWPOINT.

By H. MAYNARD RENNIE,
Sydney.

FROM the point of view of the physician, lung cancer presents many baffling problems; but in the limited time at my disposal I intend to discuss briefly some aspects of ætiology, diagnosis and treatment. I will also make some practical recommendations for an immediate approach to the situation in which we find ourselves today, and whereby we might take steps which will eventually reduce the incidence of the disease.

However, there are a few general observations that must be made. First there is no doubt that there is an actual increase in the incidence of lung cancer, so that it is now the number one cancer in males in most countries of the world. Second, this increase in incidence affects mostly the male population, for twenty-five years ago the sex incidence was in the ratio of four males to one female, and today it is eight males to one female. In other words, there is some carcinogenic influence at work which has become more operative during the last quarter of a century, and the total number of cases seems to be steadily increasing. Third, primary lung cancer is a heterogeneous group of diseases with apparently differing ætiology and prognosis. There is the well-differentiated squamous cell type which, with the anaplastic large and small cell types, occurs mostly in males and heavy smokers; but the prognosis is much better in the former than in the latter types.

In the well-differentiated adenocarcinoma group, together with bronchiolar carcinoma, the sex incidences are nearly equal, there does not seem to be any relation to smoking, and the prognosis is distinctly better than in the anaplastic group.

Ætiology.

While the exact nature of this carcinogenic influence is still a mystery, many interesting facts have become known through intensive research work in many countries by highly skilled observers. However, no one would suggest that the last word on the ætiology of this condition has been said, and there is much careful and calculated work yet to be done.

For many years it has been recognized that, in workers exposed to inhalation of dust containing radioactive materials, nickel, chromates, asbestos, arsenic, coal tar, and petroleum oils, there is a high incidence of lung cancer, so some ætiological association must be accepted. But the great increase in the number of cases occurring in those who have no such industrial association makes us look elsewhere for the cause. Or is the cause the same, but acting under differing conditions? If so, is it possible that the carcinogenic agent is still inhaled? The work of Auerbach and his group and others on the histology of the bronchial mucosa has led to some interesting observations. They noted basal cell hyperplasia, stratification, squamous metaplasia and carcinoma-in-situ diffusely distributed throughout the epithelium of the bronchial tree in both lungs as well as the trachea; such changes occurred very frequently in men who had died from bronchogenic carcinoma and who had been heavy cigarette smokers, but also to a lesser degree in the non-smoker or occasional smoker and in patients who had died of disease other than bronchogenic carcinoma. It is concluded that these findings are fully consistent with the hypothesis that inhalants of one sort or another are important factors in the causation

[1] Read at a meeting of the Section of Medicine and Experimental Medicine, the Section of Radiology and Radiotherapy, and the Section of Surgery, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

of lung cancer. What sort of inhalants? The work incriminating tobacco smoke in this regard is well known to you all. Doll and Hill in England and Wynder and Graham in the United States of America are the foremost workers in this field, and their late results seem to confirm fully their earlier conclusions. The heavy cigarette smoker (more than 20 cigarettes per day) seems to be at the greatest risk, and whether he inhales or not, whether he uses the filter-tip cigarette or not, does not seem to make any difference. These facts give us reason to pause before we accept completely the causal relationship, although that conclusion is inevitable to the statistician. The freedom of the cigar and pipe smoker is also an interesting observation. The clinician is constantly aware of the fact that a history of heavy cigarette smoking at some time in a patient's life will bias him strongly in favour of regarding an undetermined lung lesion as malignant. Of course, this cannot be the whole story, as all smokers do not get the disease and the disease occurs also in non-smokers. Are there any other inhalants? In the air we breathe we are quite likely to inhale carcinogenic substances, particularly if we live in industrialized areas and big cities, and even more so if there is atmospheric concentration through smog and fog. These carcinogens include benzpyrene and other hydrocarbons formed from incomplete combustion of carbonaceous fuel, arsenic, radioactive fallout and many others. For a valuable discussion on these I would refer you to the studies of Hueper, who states that "observations, considerations and interpretations of a large mass of factual and circumstantial evidence obtained from various sources and collected from different viewpoints do not favour the concept that the great majority of lung cancers, particularly those in men, are caused by excessive cigarette smoking". You can see that he is a strong protagonist for the polluted air theory. What about the heavy cigarette smoker living in the city and inhaling polluted air? Stocks and Campbell, from their investigation in the north of England and Wales, state that "the supposition that benzpyrene plays a dual role through cigarette and air pollution now appears to be tenable". A recent Medical Research Council report considers that there is no adequate explanation of the large increase in the incidence of lung cancer, but that heavy cigarette smoking is the principal factor. In view of this, it is possible that vested interests in this country through intensive study may help to clear the air and reduce the incidence. I think this summarizes the position in regard to the inhalant or exogenous theory.

There is still an important group of growths that occurs equally in both sexes and does not appear to be related to any exogenous influences. What causative factors can we postulate here? Very few, I am afraid. Is there a metabolic disturbance to produce a lung cancer and a neuropathy as two effects of a common cause? Or are these cause and effect? It has been shown that many cancer cells are present in the blood in the vessels leaving a tumour in the lung; what determines whether they will die or grow in remote areas? Is there a local host resistance or host susceptibility? Can we go even further and postulate a general host susceptibility or resistance?

The Diagnosis.

Most patients, when first examined by a doctor, are in an already advanced stage of their disease, and the secondary lesion often dominates the clinical picture. It is depressing to know that as many of these lesions are slow-growing and have already been present in an unrecognized form for many months or even years, the first opportunity for diagnosis and treatment is usually presented too late.

As a tumour can be growing for a long time and not produce symptoms, it is obvious that during this silent phase the earliest opportunities for recognition of the condition are given to the radiologist through fluoroscopy, mass radiography or routine X-ray examination of the chest for various reasons. This places an important responsibility on the radiologist, and we have just heard how effectively he can discharge it in this situation. The responsibility is next laid on the patient's own doctor, whether general practitioner, physician or surgeon, and it is at this point that long delays may occur, for the clinician does not wish to raise the alarm until he is reasonably sure of his ground. It is profitable, therefore, to explore ways and means of ensuring that once a patient is suspected of having lung cancer or some other unidentified lesion which could be sinister, that patient is immediately given every opportunity of obtaining the expert help that is available. If the diagnosis can be made with certainty on clinical and radiological grounds, the cancer is well advanced and is likely to be incurable. In my opinion, the greatest hope in the present unequal struggle with lung cancer is the practitioner who is constantly aware of the possibility that the condition may be present, and who is not prepared to wait for a firm diagnosis before seeking the help of the trained thoracic team. The unfortunate report of the radiologist, "? carcinoma, re-ray in one month", may cost the patient his life if the clinician in charge of the case allows his opinion to be dominated by the radiologist. The pathologist is the only person who can establish a firm diagnosis while the cancer is still curable, and then only if he is provided with the right tissue.

Mode of Presentation.

You are all aware of the ways in which patients suffering from this condition will present to you—the long-standing smoker's cough which has altered in character, the unexplained hæmoptysis, the too slowly resolving pneumonia, the localized wheeze, pleural effusion or mediastinal tumour. I would remind you of the less usual manifestations of the primary lesion—neuropathy, arthropathy or exfoliative dermatitis. I would further remind you of the manifold and often exotic manifestations of the secondary lesions—cerebral tumour, hoarse voice, the lump in the neck discovered one morning while shaving, the "slipped disc" due to lesions in the spine, the "acute abdomen" from secondary deposits in the liver, Addison's disease from adrenal destruction, acute obstructive appendicitis due to secondary deposits at the base of the appendix, and many others.

Differential Diagnosis of the Primary Lesion.

The differential diagnosis of the primary lesion will include the following: pulmonary tuberculosis, including tuberculoma—the two diseases may coexist; secondary neoplasm—usually multiple, but single secondary deposits can provide difficulty; simple tumours — hamartoma, adenoma; hydatid cyst, in various stages of rupture and infection; slowly resolving pneumonia; vascular infarct; foreign body in a bronchus, with obstruction, atelectasis and infection; toruloma; mediastinal tumour; paraffinoma —the use of paraffin should be avoided as the last ritual before going to sleep.

Special Diagnostic Procedures.

Special procedures employed in the thoracic unit, in addition to history taking, physical examination and routine radiological investigation, are as follows: (i) the use of special radiological techniques — bronchography, tomography; (ii) examination of sputum for carcinoma cells; (iii) bronchoscopy and biopsy of visible tumour or paracarinal mucosa, or collection of saline washings for examination for carcinoma cells; (iv) biopsy of enlarged glands, scalene modes, skin nodules; (v) thoracotomy and examination of frozen sections of available tissue; (vi) lobectomy and examination of the lesion after removal. With all these ancillary aids available, diagnosis is still a difficult art, to be acquired through long and painful experience.

The Treatment.

For all practical purposes there is only one curative treatment—surgical resection of the affected lobe, with or without removal of the mediastinal glands. The chief role of irradiation is palliative, and great benefit can be derived in the following states: mediastinal pressure effects on the superior vena cava or œsophagus, pain due to secondary deposits in bone, cerebral metastases, severe cough and uncontrollable hæmoptysis. Occasionally, however, irradiation will effect a cure. (A patient of mine with a squamous cell carcinoma at the lower end of the trachea was completely cured by irradiation; he had a localized tumour, and exact localization of treatment.)

The nitrogen mustards have not yet proved really beneficial, but radioactive colloidal gold is useful in some cases of recent malignant pleural effusion. In the future we shall have other chemical, radioactive or hormonal agents that will give us more effective therapy. However, with our present diagnostic and therapeutic procedures we cannot expect a five-year cure rate of more than one in every 10 cases of cancer of the lung. But I am not convinced that we have yet made the fullest use of our available therapeutic equipment. This is a challenge to our therapeutic resources and researches.

Conclusion.

There are five recommendations that I would submit.

Prevention.—(i) Advise all those who wish to smoke that they should never smoke more than 15 cigarettes a day. (ii) Prevent atmospheric pollution by potential carcinogenic agents at their source.

Early Diagnosis.—(i) All heavy smokers of cigarettes (20 or more per day), males and females, should have an X-ray examination of the chest every six months, and all films should be made available for comparison. On the recognition of any suspicious lesion, the patient should be referred promptly to his medical adviser. (ii) All patients with suspicious chest lesions should be referred without delay for full investigation by a trained thoracic team.

Early Treatment.—The thoracic surgeon should be given an early opportunity to explore the chest, and often before a definite diagnosis is made, for at least eight out of every ten patients submitted to thoracotomy on the suspicion of the diagnosis will be found to have malignant disease, and the chance of cure is then immediately at hand.

SOME OBSERVATIONS ON THE PATHOLOGY AND TREATMENT OF CARCINOMA OF THE LUNG.[1]

By JOHN HAYWARD,
Melbourne.

IN the past few years carcinoma of the lung has been "done to death" in medical literature in countless papers, annotations and editorials with endless repetition. The statistical investigations into the relation of the incidence of the disease to tobacco smoking have been a valuable contribution; but the numerous papers by thoracic surgeons and radiotherapists make monotonous and gloomy reading. I did not choose the subject of this paper, and I now find myself in the position of having to add to the already unseemly pile of verbiage on the surgery of carcinoma of the lung. As my results seem much the same as others' and I have no new discovery to report, the best I can do is to try to present the subject to you in a somewhat unusual way.

Results of Surgical Treatment and Their Implications.

I shall not follow the surgical fashion of arranging my results as percentages of selected totals so that they will not look so bad, thereby striking a false note of guarded optimism, or at least giving the impression that something satisfying and satisfactory is being achieved. In such papers one feels that the writers are trying as much to convince themselves as anyone else. If a hint that surgical successes are few creeps in, it is the fashion to counter it by a call for earlier diagnosis, thus creating the impression that this will correct the position. I shall not do this either, because I do not believe that earlier diagnosis will increase surgical "cures" to a really significant percentage. On the contrary, I prefer to come right out in the open and admit at once that, to me, the surgery of carcinoma of the lung is depressing. It is the unhappy part of thoracic surgery. For a vast expenditure of thought and energy the returns are very poor indeed, and I do not believe that improvements in surgery or radiotherapy will materially improve them. The idea that more extensive operations or more powerful X-ray machines will go an appreciable way towards the solution of the problem seems to me absurd.

From late 1946 when I began this work until five years ago, I resected 50 carcinomata of the lung and obtained nine five-year "cures". One patient died of generalized secondary deposits in the sixth year. The other eight are still alive; but one of these, now in her eighth year, had a solitary, rounded lesion, presumably a secondary deposit, in her remaining lung, controlled by deep X-ray therapy two years ago.

I could, of course, report these nine five-year "cures" out of 50 resections as 18% of successful resections, which is quite a creditable figure, and on the surface seems to give the lie to the gloomy statements I have just made; but it would be dishonest to let this figure stand. Out of every nine chests I open for carcinoma of the lung, in about four the condition is found to be inoperable. The percentage of successes out of all the operated cases is therefore about 10. Many more patients are referred to me, and about four out of five are rejected for surgery on bronchoscopic or other findings. My percentage of successes among all the patients I see is therefore about 2. Even this whittling-down of the figure from 18 to 2 does not give the true picture. At least half the patients seen by my corresponding physicians are so obviously in a hopeless condition on clinical grounds without bronchoscopy that they are not referred to me at all. If all are included as they should be, the figure for my successes is, at most, 1%.

I suspect that even this modest figure is too high; but let us assume that a thoracic surgeon may expect to give one out of every 100 patients with carcinoma of the lung in the population he serves five or more years' survival. Surely this figure shows that surgery is not the answer to the problem. Can it be reasonably maintained that the vast numbers of clinical examinations, X-ray examinations, laboratory tests, bronchoscopies and thoracotomies which go to produce the handful of survivors are economically sound from the point of view of society as a whole? Nevertheless the work must go on, because material considerations are not the only ones, and no one should be denied his chance of becoming one of the survivors—a chance which is at least much greater than that of winning the lotteries to which Australians so enthusiastically subscribe.

Even if earlier diagnosis was to increase the successes threefold, an optimistic estimate, they would still form only 3% of the total. However, teaching and propaganda among medical men, so that they shall not overlook significant early symptoms and signs, are obviously desirable. We have no excuse for not aiming to get the best results possible. Propaganda to the public about the early symptoms of lung cancer recently begun by anti-cancer organizations is another matter. It can too easily become a form of scare-mongering, encouraging hypochondriacal fear. This might be justifiable if the early symptoms were not vague and liable to be produced by other diseases, or if we had good treatment to offer, but is hardly justifiable in present circumstances.

On the other hand, though many causes, hereditary and environmental, combine to initiate lung cancers, there is now no doubt that various sorts of atmospheric pollution, including tobacco smoke, play an important part, and propaganda to urge young people never to take up smoking and in support of measures to minimize all forms of atmospheric pollution in cities and factories should receive our whole-hearted approval.

Pathology.

Only a few aspects of the pathology of carcinoma of the lung can be mentioned here. On macroscopic findings it is convenient to divide the growths into central, arising near

[1] Read at a meeting of the Section of Medicine and Experimental Medicine, the Section of Radiology and Radiotherapy, and the Section of Surgery, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

the hilum of the lobe or lung, and peripheral, arising well out in a lung segment. The former commonly cause bronchial obstruction followed by infective complications. The latter produce localized, circumscribed opaque areas often first discovered in mass X-ray surveys. Sometimes central necrosis and secondary infection produce a carcinomatous abscess. A small subpleural primary growth, clinically and radiologically inapparent, may spread extensively in the pleural cavity. A chronic pleural effusion associated with an apparently clear lung does not therefore exclude the possibility that a bronchogenic carcinoma is its cause.

Histologically, the commonest growths form a series graduating from squamous to anaplastic. It is this type which is partly caused by tobacco smoke and is much commoner in men. Adenocarcinomata are less common and have an approximately equal incidence in men and women. Both types spread by the lymphatics, the blood-stream and, sometimes, the pleural cavity. Distant metastases are common in the liver, suprarenals and brain, but may occur anywhere.

A third, uncommon type is the alveolar carcinoma. The involved alveoli become lined by a layer of large, irregular neoplastic cells packed in more or less columnar fashion. They prevent gaseous exchange and spread to more and more alveoli. The process may start in one area, spreading later to other parts of both lungs. At other times there are multiple foci, often bilateral when the patient is first examined. Whether this growth spreads by the air passages or has a multicentric origin is not known. Characteristically the air passages themselves are not involved and it does not spread by lymphatics, blood-stream or pleura. It is usually said that distant metastases sometimes occur; but I suspect that these patients are really suffering from a bronchogenic carcinoma mis-diagnosed as alveolar. Removal of an involved lobe or lung before the remainder is involved relieves symptoms temporarily, but the process always seems to start again on the same or opposite side within two or three years. Death is by slow suffocation, when too little uninvolved lung tissue remains for survival.

Selection of Cases for Surgery.

Bronchoscopy in suspected carcinoma of the lung aims at establishing the diagnosis and detecting inoperability, but frequently these two aims are not achieved. Absolute proof of the diagnosis by biopsy is likely only with central growths, and secondary hilar and mediastinal glands must be very extensively involved before the main bronchi are visibly fixed and deformed by pressure from without, the carina is widened and the left vocal cord is paralysed. Growths are frequently inoperable long before any of these bronchoscopic signs of inoperability have appeared. Often the decision whether or not to operate has to be made in an atmosphere of uncertainty.

Some cases are straightforward. The single, circum-scribed peripheral opacity which has been proved present for more than a month or two and is associated with normal bronchoscopic findings seldom presents any problem, especially if it is increasing in size. Operation is advised because, even if the lesion is not a carcinoma, it is almost certain to be better removed, and resection in this type of case carries very little risk. The central growth seen at bronchoscopy, proved by biopsy and showing no bronchoscopic signs of inoperability, and from which no distant metastases are detectable, is also a straightforward indication for thoracotomy. At the other extreme, the growth associated with bronchoscopic signs of inoperability or with evident pleural involvement or distant metastases is obviously rejected for surgery.

Unfortunately, in many cases bronchoscopic and other evidence fails to give such definite indications for or against surgery. These doubtful cases fall roughly into two groups, those in which the diagnosis of carcinoma is unproved and very doubtful, and those in which the diagnosis of carcinoma is proved, but its operability is doubtful.

Many of the first group are patients with a fairly localized but not sharply circumscribed opaque area, which may be only a chronic pneumonic condition. Physicians and general practitioners often urge the surgeon to open the chest and have a look on the assumption that this will do no harm. It is true that thoracotomy without resection is very safe; but what they do not realize is that the surgeon will not know the diagnosis simply by "looking" at such a lesion. Dense adhesions usually surround chronic infective lesions and must be divided before the diseased part can be super-ficially inspected and palpated. This often fails to exclude the possibility of carcinoma, and the taking of a superficial piece for biopsy is not enough, because seeing chronic inflammation here does not prove that there is no deeper growth to which the infection is secondary. The surgeon is usually driven to resect the whole lesion and examine it macroscopically and by the preparation of frozen sections. Unfortunately, resection of an area of chronic pneumonia is associated with an appreciable mortality and a relatively high morbidity (empyema and bronchopleural fistula). Operation in these cases, therefore, not only does the patients no good, but is also dangerous.

The second group of patients with proved carcinoma of the lung of doubtful operability is equally worrying. The doubt may be due to the carina's seeming a little, but not definitely, widened, or the main bronchus may be slightly fixed. The mediastinal shadow in the chest film may be vaguely irregular at its lateral margin, suggesting, but not proving, that mediastinal glands are involved. Perhaps the growth may extend to within half an inch of the trachea, leaving a doubtful margin for clean resection. This applies particularly to growths protruding from the right upper lobe bronchus. Very few growths with indefinite signs of inoperability such as this are found at thoracotomy to be operable. Often the surgeon feels sure that thoracotomy will be useless; but if the patient's physician or relatives ask him if he is quite sure, he has to admit that absolute certainty can be obtainable only by performing the exploratory operation. Fortunately an exploratory thoracotomy to prove inoperability does not involve any lung resection and is therefore safe; but no operation is without some risk, and all surgery produces some pain and discomfort. It is distressing to a conscientious surgeon to find that he has performed an operation which has proved useless, and has taken a few weeks from a dying patient's limited life at home with his family.

In both groups of doubtful cases it would be much easier to take the firm attitude that every patient who has a lesion which could be a carcinoma of the lung, or who has a proved carcinoma with the slightest possibility of operability and whose general condition makes him fit for pulmonary resection, should have a thoracotomy, and advise it as a routine measure. The argument would be that this rule-of-thumb policy gives the greatest good to the greatest number; but is it sound? How many of the rare five-year cures of carcinoma does it take to counter-balance one death from unnecessary resection of an area of chronic pneumonia in a patient who might have lived 20 years without operation?

There is, of course, no answer to such questions; but it does no harm to ask them, and a great deal of good if it encourages us to use discrimination in the doubtful cases. When clinical judgement makes the surgeon reasonably sure that the lesion is not a carcinoma, he should be prepared to take the responsibility of advising against operation, awful though the responsibility is. He must accept the fact that he may be wrong, and that occasionally one of these patients will return later with an inoperable growth which theoretically might have been curable when he first examined him; but if he is a good clinician this will rarely occur, and the large number of unnecessary operations on other patients which he will have avoided will amply compensate for it. It is particularly important to exercise this discrimination in these days of chemo-therapy when many more patients are surviving pneu-monic infections which, instead of resolving, lead to

fibrosis, which produces long-standing more or less solid X-ray shadows resembling neoplasms with or without secondary infection.

Likewise, in proved cases of carcinoma of doubtful operability, discretion can be used. When cases are borderline from other points of view, I think it is better to take the responsibility of refusing surgery. For instance, a degree of associated emphysema or cardiovascular disease which would be acceptable in the presence of a carcinoma which looked promising for surgical removal might make one reject a doubtfully operable tumour. The histology of the growth is also a factor to be considered. It is rarely worthwhile opening the chest of a patient with a doubtfully operable anaplastic growth, whereas a squamous carcinoma of apparently similar extent may well be worth an attempt at radical removal.

Operations for Carcinoma of the Lung.

As I am not speaking to thoracic surgeons, surgical details would be out of place here; but there are some problems which arise during operations for carcinoma of the lung which may be of general interest.

Every case is sooner or later labelled operable or inoperable, but it is surprising how difficult concise definition of these terms is. A carcinoma of the lung is operable if there is no evidence of distant metastases and all the visible growth in the thorax can be safely removed. It need not be confined to the lung. Involvement of hilar and mediastinal glands or pericardium or even, rarely, part of the chest wall or diaphragm may not make a growth inoperable if all the involved structures can be removed. The term "operable" implies that successful operation gives some chance of cure. Applied to a case before thoracotomy it is but an estimate of the situation, and it becomes definite only at the end of a successful resection. It is regrettably common to find the growth more extensive than was suspected pre-operatively.

A growth is inoperable when its complete removal is impossible. In such a case there is no chance of surgical cure. Blood-borne metastases to other parts of the body, pleural metastases, direct involvement of mediastinal structures such as the main pulmonary artery, aorta or œsophagus, and lymphatic spread to glands at the root of the neck are common causes of inoperability.

Many inoperable growths are also irremovable with safety; but at operation, when an inoperable growth is revealed, it is sometimes found that the lung and perhaps some of the growth beyond it can be removed without killing the patient. In these few cases in which the growth is inoperable but the lung is removable, the question arises whether its removal is justified on the grounds that this operation will be palliative. Unlike some of my surgical colleagues, I believe that such operations are rarely really palliative. There is a high mortality from pneumonectomy when growth is either deliberately or inadvertently left in the chest. In nearly all my operative deaths from pneumonectomy for carcinoma, post-mortem examination has shown residual growth in the chest and often elsewhere, as in the liver, too. The survivors rarely last more than a few months, which seem little less miserable for them than they would have been with their lungs intact. It is therefore my policy at thoracotomy to perform whatever dissection, if any, is necessary to establish either that all the visible and palpable intrathoracic growth cannot be removed, when the operation is abandoned at once, or that all the visible and palpable intrathoracic growth is removable, in which case I go ahead and remove it.

The question arises, how much more than the visible growth should be removed? Is it sufficient to perform a lobectomy for a peripheral growth with no apparent glandular involvement? I believe that lobectomy is sufficient in such a case. I begin by dissecting and examining the lobar lymph glands, by frozen section if necessary. If no growth is found in them and the hilar and mediastinal glands seem clear on superficial inspection and palpation, I remove no more than the lobe. Recently, in a few elderly patients with emphysema I have even been satisfied with a segmental resection. So far the subsequent course of these patients has been no worse than after pneumonectomy. Indeed it has been better, no doubt because a growth that can be removed by a limited resection is a very "early" one.

I am particularly interested in post-mortem examinations on my patients who die of secondary deposits months or years after resection for carcinoma of the lung, and I obtain them whenever possible. In many no local recurrence has been found in the thorax. This applies to local resections as well as to pneumonectomies. Death has usually been due to blood-borne metastases, and surgery can never hope to cope with these. Late deaths without intrathoracic recurrence are clear evidence that the surgery has been technically adequate.

Radiotherapy.

If surgical "cures" of carcinoma of the lung are rare, "cures" by deep X-ray therapy are even rarer. For practical purposes the treatment should be regarded as palliative only, and in view of the fact that it will seldom be effective more than once, it should be withheld until there are definite symptoms to be relieved by it. The main indications are superior mediastinal obstruction, continuous pain and persistent incapacitating infection due to bronchial obstruction by the growth. Anaplastic growths respond best, but for a short time only; squamous carcinomata less readily, but for longer. Adenocarcinomata and alveolar carcinomata are little affected, and I do not refer such patients for this treatment.

The radiotherapist should remember that the treatment is for palliation, and should see his patient frequently during the course and be prepared to reduce the dose or abandon the treatment if the misery it produces exceeds the relief of other symptoms. He should be a physician, and not merely a physicist who makes calculations of dosage and then abandons the patient to the machine and the technician.

I do not think that radiotherapy after apparently successful surgical removal is indicated. Radiotherapy before surgery to make operable growths which are inoperable because of their nearness to the hilum has been tried, but the late results of this combined treatment are not very encouraging. Chemotherapy with compounds of the nitrogen mustard group, sometimes combined with radiotherapy, may help to inhibit anaplastic growths.

The Management of the Patient with an Inoperable Growth.

We have to admit that the science of medicine, represented by diagnosis by general practitioners and physicians and treatment by surgeons and radiotherapists, helps very few patients with lung carcinoma. What of the vast majority who remain? In all the spate of literature which has appeared recently on this subject, their management is seldom mentioned. Surely here the art of medicine should fill the breach. Being a mere specialist surgeon, I ought not to be nearly so well qualified to speak on this aspect as my general practitioner colleagues; but I am moved to do so because I have had patients, whom I have referred back to their general practitioners after an exploratory thoracotomy which revealed an inoperable growth, return to me in despair saying that their doctor says "he can do nothing for me".

This is not only appalling; it is quite untrue. A great deal can be done for these people, though I admit that it is difficult to do it—much more difficult than resecting an operable growth. After all, any doctor can treat curable disease; but it takes a very good medical man indeed to treat chronic incurable disease well. It is only such men that are truly good doctors in the fullest medical sense of the word.

Occasionally, when my general practitioners let me down, I have had to assume responsibility for the management of patients with inoperable carcinoma of the lung. This experience had led me to follow certain rules which

I have formulated largely by myself. They apply, with minor modifications, to inoperable growths arising in any organ. Teachers and textbooks are singularly uncommunicative on this aspect of medicine. It takes courage to speak of it, because moral issues are involved. With some diffidence I shall now outline my approach to the problem.

Before embarking on thoracotomy for proved or suspected lung cancer, I always explain to the patient that it is not certain whether none of the lung, part of the lung, or all the lung should be removed, and I obtain his permission to do whichever of these three seems best for him. Then, after the operation, he invariably asks whether any of the lung had to be removed. In the inoperable case the answer is no. They are all satisfied with this. Indeed, many imagine that it is a good sign.

Unless the lesion looks very certainly operable, do not threaten the patient with cancer in order to make him agree to thoracotomy. The results of surgery are far too bad to justify such cruelty.

One must never, on any account, say a patient has lung cancer without absolute proof. This usually means histological proof, or the presence of such obvious secondary deposits elsewhere in the body that there can be no doubt whatever. One cannot afford to be wrong in the definite diagnosis of cancer. If doubt exists, however slight, say so.

When there is absolute proof, always tell close relatives and warn them to tell nobody else. If they do, it will sooner or later come round to the patient. Point out to them also that happiness is still possible when one is dying of cancer, and that their job is day by day to get all the joy they can from the company of their loved one, leaving the morrow to take care of itself. They will always ask "how long". Say that no one can tell. Never "give" the patient such-and-such a time to live. Life is not yours to give. You are not a prophet and should not pretend to be one. Definite prognoses are always wrong and do a great deal of harm. When pushed, I say that I can do no more than guess, and that between weeks, months and years I would guess whichever of the three seems most likely in the particular case. I go on to tell them of an extraordinary woman I had who survived for nine and a half years, which included a very happy six months' trip to England (at thoracotomy she had pleural secondary deposits and the diagnosis was proved by biopsy).

Never tell the patient himself that he has cancer unless he looks you straight in the eye and asks point blank. Then, if you have absolute proof, say yes at once, because *the point blank question means that he is mentally ready* for the affirmative answer and will be happier with definite bad news than with indecision. To the vague question "What did you find wrong?", say "a blockage in an air tube" if it is a central growth, or "part of the *spongy lung gone solid" if it is a peripheral growth*, and so on. For instance a malignant pleural effusion can be called a "wet pleurisy". In short, everything you say must be absolutely true as far as it goes. You will find the patients perfectly satisfied with these explanations. *To the oblique question "I don't suppose it was cancer"* spoken with eyes averted, give the same explanations, ignoring and avoiding the word cancer. When patients behave this way, *their minds are not ready for the naked* truth and it is cruel to give it. Tell the relatives exactly what you have said to the patient, and tell them to say the same to friends and acquaintances.

If the patient is still fit to continue his job for the time being, *send him back to work. If not, give suitable advice.* Often he is nearing retiring age, and you can advise early retirement. Sometimes he has accumulated sick leave which you can advise him to take. If he is in a business, you may be able to suggest handing over more responsibility *to his son or selling it. If you have taken a proper* personal and family history, sound advice suitable to the particular case always suggests itself.

Always warn the patient that conditions such as his need a prolonged period of medical supervision and treatment, and that various symptoms such as cough will not dissappear overnight or even within a few weeks, but say that they can be controlled by medicines. Tell him that in cases like his the sputum is occasionally blood-stained, but that this is a normal part of the condition and of no consequence, so he need not worry about it. Say that his lungs are not so good as when he was younger, and that, though he should keep active and do all he comfortably can, he should take care of them and not drive himself to the point of exhaustion. In short, do everything possible to get him to accept his limitations and maintain his hope. Above all, keep him convinced that you are still interested in every detail of his case and confident that, whatever symptom may crop up, you are willing and able to do something about it.

When symptoms are mild, a cough mixture during the day and linctus at night with an occasional simple analgesic tablet is all that is required. Exacerbations of acute secondary infection may respond quite well to chemotherapy. A "tonic" will please the patient. Later, when severe breathlessness, pain or harassing cough which interferes with sleep supervenes, in all except those who are nauseated by it, I have found opium given by mouth by far the best drug. My prescription is as follows: tincture of opium 15 minims, camphorated tincture of opium 15 minims, chloroform water to two drachms. I call it the special cough mixture or breathing mixture or pain mixture, according to which is the patient's most distressing symptom, and I tell him it is quite harmless and can be taken as required, double doses at night and repeated during the night if necessary. I warn him that its only troublesome effect is to cause constipation, and that he should also take an aperient such as "Agarol" regularly in whatever dosage he finds necessary.

This mixture becomes the elixir of the gods to patients. They begin to smile again, eat more and do more. It is not a form of euthanasia. On the contrary, it prolongs their lives. Even if they go on for months, the amount they take usually increases very little. Near the end, when they are bedridden, it produces the calm detachment of the opium smoker, so that they fade peacefully away. By this time they often realize more or less clearly that their days are numbered, but the opium makes it seem of no particular importance. If they bother to talk about it at all, it is with calm acceptance. *Others imagine they will* get better right to the end. Provided there are no cerebral metastases, they are mentally alert till the final unconsciousness.

As far as possible I avoid all sedatives such as barbiturates, or use them sparingly. They cause mental depression and gloomy foreboding, whereas opium, alone, *puts on the proverbial rose-coloured spectacles.* I also avoid the various "tranquillizers", which are apt to cloud judgement. So long as they are physically capable of it, patients on opium are *quite safe to drive their motor-cars* and make sensible decisions about their business affairs. *Only at the very end, when they are already bedridden,* may a few injections be necessary.

Every medical man should realize that it is possible to take a great deal of the horror to patient and relatives out of death from cancer. Most of them are elderly and *have already had the greater part, if not all, of their* period of active, creative life. It behoves us to try to make death come to them, as to Job, with a sense of fulfilment and peace *"like as a shock of corn cometh in, in* his season".

Summary.

Considered in terms of the total sufferers from the *disease, the results of surgery for carcinoma are very* poor. Perhaps 1% achieve a five-year "cure".

*The pathology of the condition is given brief considera*tion, some problems in selecting patients for surgery are discussed, and the types of operation are briefly outlined.

The management of the patient with inoperable cancer is given in some detail.

THE LIMITATIONS OF THE RADIOLOGICAL METHOD IN THE DIAGNOSIS OF CARCINOMA OF THE LUNG.[1]

By M. G. F. DONNAN,
Perth, Western Australia.

WITH increasing awareness of cancer of the lung and with the more frequent opportunity to correlate the radiological and the histopathological findings, it might be presumed that the diagnosis of pulmonary carcinoma was a simple matter. Such a presumption would be wrong. It is only now with more mature experience that it is recognized that lung cancer may present radiologically in many forms—those attributable to the growth itself, those the result of obstruction, infection and necrosis, and those due to local extension or to remote metastases when the primary tumour may be radiologically inconspicuous.

Sosman has pointed out that 95% of significant or symptomatic conditions produce demonstrable changes in the radiographic appearances of the lungs. However, when it comes to identifying the nature of the disease process there is a wide divergence of certainty, the least dogmatic being the skilled radiologist in the competent thoracic unit.

I propose today to present a series of cases illustrating some of the causes of uncertainty in the radiological opinion.

The first case highlights the limitations of the conventional postero-anterior projection of the chest in the exclusion of carcinoma of the lung as a cause of pulmonary symptoms.

A male patient, aged 64 years, for six months had had blood-stained sputum. Prior to this he had been in excellent health, with no significant disabilities. He had noticed shortness of breath on heavy exertion for the last few months. The clinical notes record that he smoked 14 to 16 ounces of tobacco per week. The postero-anterior projection of the chest was considered as showing no evidence of pulmonary disease.

In view of the patient's symtoms, bronchoscopy was carried out. This showed a tumour encroaching on the left lower lobe bronchus, considered to be a carcinoma. Left pneumonectomy was performed. The pathological report was of a small, brownish, pedunculated tumour projecting into the first part of the left lower lobe bronchus. It measured one centimetre in diameter and projected from the orifice of the posterior apical bronchus. It was continuous with a lobulated and apparently fairly well encapsulated tumour measuring 3·5 centimetres in diameter, which invaded the parenchyma about the bronchus. Histologically, the tumour was a rather well differentiated papillary adenocarcinoma probably starting as a bronchial adenoma.

A conventional lateral projection or an over-penetrated postero-anterior projection would have displayed this tumour, which was hidden in the mediastinal shadows in the conventional postero-anterior film. The minimal radiological requirement in the investigation of a patient with pulmonary symptoms is therefore a postero-anterior and lateral projection of the chest of good quality.

The second case illustrates the development of carcinoma as a concomitant of another disease process which already dominates the radiological picture, leading to misinterpretation.

A male patient, aged 42 years, had been under observation since 1949 with bilateral apical scarring. Examination of sputum and gastric lavage in 1949 failed to disclose the tubercle bacillus. In 1955 he complained of pain in the right side. Radiological examination of the chest demonstrated a small right apical opaque area, which became progressively larger. Bacteriological examination still gave negative results. The patient had no cough and had lost no weight.

Right upper lobe lobectomy was carried out. There were many adhesions between the upper lobe and the chest wall. The upper lobe was very small and contracted, and its place was taken by expansion of the middle lobe. The upper lobe was almost completely replaced by a solid tuberculous lesion.

The pathologist reported the presence of an anaplastic scirrhous carcinoma, probably an adenocarcinoma, containing relatively few mitoses and some tumour giant cells.

It is worth emphasizing that the presence of calcification in a pulmonary opaque area does not exclude the diagnosis of carcinoma—it may be in adjacent tuberculous caseous material or, less frequently, in necrotic tumour tissue.

The third case is presented to illustrate the danger of *uncritical acceptance of the conclusions of authority.*

A male patient, aged 63 years, had been well until five months before his admission to hospital, when he suffered an attack of influenza. His cough was distressing at times, and a variable amount of sputum persisted. He was examined radiologically every month from October to December. It was recognized that he had a collapsed middle lobe, that his condition was probably a Brock's middle lobe syndrome, and that future surgery seemed indicated. Three weeks prior to his admission to hospital the patient noted that his sputum was blood-stained; he was anorexic and had *lost half a stone in weight. He was admitted to hospital* for lobectomy.

Pneumonectomy was performed in February, five months after recognition of the collapsed middle lobe. At operation there were a few adhesions over the middle lobe. The fissures were obliterated and there were many hard and calcified glands in the hilum. The middle lobe was partly collapsed. A portion of a gland was sent for microscopic examination, and was found to be cancerous. There were no palpable glands in the mediastinum.

The pathologist reported a rather cellular, moderately anaplastic squamous cell carcinoma with occasional horn pearls. The tumour had produced much fibrosis and was found in the hilar glands. A large calcified gland attached to the bronchus appeared free of growth.

This patient died seven months later with multiple scattered secondary deposits—in the parabronchial lymph nodes, the left adrenal gland, the kidneys and the vertebral column.

Brock, in 1950, made the following statement:

> In a series of 1200 cases of bronchial carcinoma I have seen only eight cases occurring in the middle lobe .... In no case did the carcinoma arise in the stem bronchus of the middle lobe and cause obstruction and secondary consolidation.
>
> In contradistinction to those eight cases of carcinoma arising solely in the middle lobe, I have seen sixty cases of obstruction and infection of the middle lobe due to active or old tuberculous lymphadenitis.
>
> It will thus be seen that the most likely thing to occur in the middle lobe is not a carcinoma but a lesion due to post-tuberculous broncho-stenosis or bronchiectasis.

Brock concluded from his experience that carcinoma of the middle lobe bronchus was a rarity, and this opinion was accepted for fact. Further experience has shown the fallacy of this assumption.

The fourth case illustrates a not uncommon manner of presentation of lung cancer—a chronic pulmonary abscess.

A male patient, aged 68 years, presented with complaint of pain in the right side of the chest of four months' duration. His sputum was blood-stained. He had not lost weight. A routine pre-operative X-ray examination in 1955 had shown no evidence of pulmonary disease. A film made nine months later, in 1956, after one small hæmoptysis, demonstrated a significant lesion, but it was not observed. The film made on his latest admission to hospital showed a chronic abscess of the lower lobe of the right lung.

At bronchoscopy, the wall of the posterior basal bronchus was bulged by external pressure, but no actual tumour was seen. The operative finding was of a large tumour within the lower lobe of the right lung, infiltrating the chest wall. The abscess cavity was infected. The abscess was drained, with oversewing of the malignant abscess wall.

There are no absolute criteria as to whether or not an abscess has its origin as a carcinoma. The tumour is usually circumscribed. Nodularity of its lining suggests

[1] Read at a meeting of the Section of Medicine and Experimental Medicine, the Section of Radiology and Radiotherapy, and the Section of Surgery, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

newgrowth, but the wall may be quite smooth. It may present the appearance of a thin-walled cyst possibly with a fluid level, when confusion with a tuberculous distension cavity or an infected congenital cyst may arise. Such a case is reported by Strang and Simpson, in which the patient spent months in a sanatorium with a diagnosis of tuberculosis before the disease revealed its true nature.

Bronchial carcinoma ranks high as an ætiological factor in the causation of lung abscess. Brock, reporting in 1948, found an incidence of 13·8%, and he points out how much more important it is in the causation than better described conditions such as inhaled foreign body.

Anderson and Pierce offer an explanation of the possible mechanism of the formation of thin-walled carcinomatous cysts; they think that a thin layer of malignant cells grows into and lines a preexisting cavity, the cavity being formed either by pressure changes consequent on a valvular obstruction to a bronchus by a small nodule of growth, or by inflammatory changes in the proximity of but not involving the neoplasm.

The fifth case is demonstrated to indicate an unusual manner of presentation—progressive ischæmia of a lung.

The patient was a man, aged 52 years. In August, 1955, prominence of the left hilar shadowing was observed on the occasion of a mass miniature radiographic survey. The patient was well. He was kept under observation, and in March, 1956, the left lung was reported as showing "a ground glass appearance" with mediastinal shift to the left, and the chest physicians questioned the possibility of atelectasis. He remained well; but in June, 1957, he developed a swelling of the right fifth rib, and a chest X-ray film at this time showed the appearance of the lungs substantially unaltered but for an erosive process of the anterior end of the right fifth rib which was considered a possible secondary deposit. A biopsy of the lump was performed and proved it to be a metastatic carcinoma, poorly differentiated, but probably squamous in type. Bronchoscopy showed narrowing of the left main bronchus.

The patient became very disorientated, and died two weeks after his admission to hospital. Post-mortem injection of the lung revealed gross constriction of the left pulmonary artery and bronchus due to neoplastic involvement of glands arising from a small carcinoma of the left lower lobe bronchus.

The diminution of lung volume is considered to be due to reduction of blood flow rather than to impaired aeration.

The sixth and last case is demonstrated to illustrate the difficulty in diagnosis that may arise when the presenting symptoms are due to remote secondary deposits.

A male patient, aged 32 years, was first examined in August, 1956, with a history of having injured his left ankle one month previously. One week before his admission to hospital he had developed pain at the site of injury. Osteomyelitis was suspected, and his symptoms were relieved by treatment appropriate to this condition. The radiographic appearances were normal.

He was readmitted to hospital in March, 1957, with a complaint of persistent pain and swelling of the left ankle joint. The provisional diagnosis was infective arthritis, possibly tuberculous. Culture of the joint aspirate revealed no tubercle bacilli, and the Mantoux test produced a negative response. In May the patient had a sudden convulsive seizure. On his regaining consciousness, no localizing neurological signs were found. Lumbar puncture revealed no abnormality. He subsequently had several seizures. His condition rapidly deteriorated. He developed vomiting and diarrhœa and became extremely dehydrated. He was finally irrational and noisy. During this period in hospital progressive osteosclerotic and destructive changes were seen in the films of the left talus. His chest film, however, remained clear save for a destructive process in the left seventh rib.

Post-mortem examination revealed a circular firm white tumour some two to three centimetres in diameter surrounding the right middle and lower lobe bronchi; microscopic examination of sections of this showed it to be a mucin-secreting adenocarcinoma. Examination of the sections of the talus showed extensive adenocarcinomatous deposits in the marrow accompanied by marked fibrous tissue reaction and osteoblastic activity leading to bony sclerosis. Large areas of tumour and bone had undergone necrosis. The articular cartilage was intact. Examination of the section of the left seventh rib showed a secondary deposit of tumour with fibrosis, osteosclerosis and necrosis. There were in addition widespread metastases in other tissues, including the brain, jejunum, liver and adrenals.

Conclusion.

Discussion of the differential diagnosis of "coin" lesions of the lung has been omitted from this paper, as it has been well treated elsewhere. Nor has an assessment of the value of the barium bolus or of angiography in the diagnosis of lung cancer and its extent been made. No comment has been offered on the rather exotic suggestion of a negative correlation between carcinoma of all types and atherosclerosis made by Wauncher and his associates.

However, sufficient evidence has been adduced to support the contention that the radiological diagnosis of lung cancer is no simple matter. What is important is to be ever alert to the possibility that a shadow of doubtful nature may be due to cancer.

Acknowledgements.

My thanks are offered to the radiological and pathological departments of the Royal Perth Hospital for providing details of the investigation of these patients, and to the clinicians of the hospital who have allowed me to present the history of patients under their care.

References.

ANDERSON, H. J., and PIERCE, J. W. (1954), "Carcinoma of the Bronchus Presenting as Thin Walled Cysts", *Thorax*, 9 : 100.

BROCK, R. C. (1948), "Studies in Lung Abscess", *Guy's Hosp. Rep.*, 97 : 75.

BROCK, R. C. (1950), "Post-Tuberculous Bronchostenosis and Bronchiectasis of the Middle Lobe", *Thorax*, 5 : 5.

STRANG, C., and SIMPSON, J. A. (1953), "Carcinomatous Abscess of the Lung", *Thorax*, 8 : 11.

WAUNCHER, O., CLEMMESEN, J., and NIELSEN, A. (1951), "The Negative Correlation of Atherosclerosis and Cancer", *Brit. J. Cancer*, 5 : 172.

Reviews.

Baillière's Nurses' Dictionary. Revised by Barbara F. Cape, S.R.N., S.C.M., D.N. (Lond.), with a foreword by Sir Cecil Wakeley, Bt., K.B.E., C.B.; Fourteenth Edition; 1957. London: Baillière, Tindall and Cox. 5¼" × 3½", pp. 544, with many illustrations. Price: 6s. 6d. (English).

THIS little dictionary, which would slip into an average-sized pocket, is now in its fourteenth edition, having first appeared in 1912. The present edition has a new editor, Barbara F. Cape, who has completely revised and added to the existing text. It should be of value not only to nurses, but to many other members of auxiliary services of the medical profession, first-aid workers and members of the general public who are looking for the meaning of medical terms not usually included in an ordinary dictionary.

Structural Psychology: De Humani Mentis Fabrica. By D. and K. Stanley-Jones; 1957. Bristol: John Wright and Sons, Limited. 8½" × 5½", pp. 188. Price: 21s. (English).

IN this book, with its rather grandiloquent subtitle, D. and K. Stanley-Jones present their theory of the thermal origin of emotion. After consideration of the feeding cycle of the infant and the significance of sucking and biting, with early frustration reactions and their relation to anxiety, the authors suggest that the equilibrium of daily life is based on a "co-operative balance" between oral-sucking lust (parasympathetic) and oral-biting rage (orthosympathetic). Turning now to the headquarters of the autonomic system, the hypothalamus, the authors refer to appetite and thermal centres, which regulate eating and heating. Thermostasis is a primary function, and since it is efficient within a week after birth it may well be the primary function of the autonomic. Further, thermal responses are related to adaptation to day and night, waking and sleeping, dating back to palæolithic cave life. At this stage we may ask why thermostatic regulation should be deemed more basic than respiration. At about five months there occurs a "formative crisis", with more or less reconciliation between "love and hate", as the provider of food and comfort satisfies these elementary needs, and with significance for later developments in emotion and character.

Subsequent chapters deal with early training and emotions, kybernesis, and the physical basis of anxiety, in which the

authors seek further to correlate their psychoanalytical investigations with neuroanatomy and physiology. They conclude with the assertion that the structure of the mind and the structure of the brain are sufficiently alike to warrant the statements that they are identical. They also suggest that low-frequency Hertzian waves could be the basis of telepathy. The work deserves close attention, but the authors must expect a vigorous challenge to their propositions.

Science and Psychoanalysis. Volume I: Integrative Studies. Edited by Jules H. Masserman, M.D.; 1958. New York. London: Grune and Stratton. 8½" x 5", pp. 208. Price: $5.75.

THIS book, the first of a series of volumes, contains papers presented to the Academy of Psychoanalysis at its inauguration in 1956. In a paper on biological roots, D. M. Rioch outlines a concept of behavioural transactions and explains that psychoanalysis asks "Why?" rather than "What, where and how?". Behaviour is studied in its temporal contexts; memory involves delay in responses. Speaking as an anthropologist, G. Devereux complains that there has been too much armchair interpretation of cultural data in psychoanalytical terms. The human mind and culture are co-emergents, not derived one from the other. The anthropologist and the psychoanalyst both study the *soön politikon*, but from different angles. Abram Kardiner disputes this viewpoint with the claim that study of individual and group motivations are complementary, not separate disciplines. Other papers deal with pre-Freudian origins, communication difficulties among psychiatrists, philosophical appraisal, and psychoanalysis and systems theory; in the last of these J. G. Miller contributes a table setting out parallel notions in various formulations about distribution of nervous energy, memory traces, consciousness, the ego, defence mechanisms and other psychoanalytical concepts.

After all this heavy going the editor, J. H. Masserman, concludes with an amusing dissertation on music and culture, "Id Isn't So with Music", which he embellished at the time of its delivery by playing various themes on his violin. May we look forward to a recording with the next edition of this book, which will interest psychoanalysts and philosophers mainly? Many will conclude that the gap between the sciences and psychoanalysis is bridged by a flying-fox running on a very slender line.

Leptospirosis in Man and Animals. By J. M. Alston, M.D., F.R.C.P., and J. C. Broom, O.B.E., M.D.; 1958. Edinburgh and London: E. and S. Livingstone, Limited. 8½" x 5", pp. 380, with many illustrations. Price: 40s. (English).

THIS is the first book in English which deals with all aspects of leptospirosis, and as such it is assured of a warm welcome from clinicians and laboratory workers alike. The authors have compiled an excellent summary of existing knowledge in this field. It is accurate and easy to read.

Treatment of the subject follows a definite pattern. Four chapters at the beginning are devoted to the morphology, physiology, classification and distribution of leptospires in the countries most affected. Then follow eleven chapters on leptospirosis in man, three chapters on leptospirosis in animals, and a final chapter on the occurrence of leptospirosis in the countries most affected. There is a very useful appendix on laboratory methods, and an extremely comprehensive and trustworthy bibliography. It is pleasant to see photographs of pioneers such as Weil, Inada, Noguchi and Schüffner included in the text.

In classification of leptospires the authors have adhered rigidly to the criteria approved by the Leptospira Subcommittee of the International Committee on Bacteriological Nomenclature, and they have accepted only those serotypes which conform with them. However, it may surprise many readers to learn that there have now been isolated from man and animals at least thirty-nine serotypes that are morphologically identical but possess sufficient antigenic differences to warrant separate names. Thirteen serotypes are known to occur in Australia; ten have been fully studied, and of these no less than seven were first isolated in this country. Indeed, readers cannot fail to be impressed by the frequent reference in the text to Australian (and particularly to Queensland) workers.

Leptospirosis is not at all uncommon in Australia. For example, every year about 200 cases are notified in Queensland alone. It can occur not only where sugarcane is grown, but also in the dairying and pig-raising industries. It can occur, too, in cities where certain occupational groups (e.g., sewer workers, slaughtermen) are exposed to infection from rats, pigs or cattle.

Only minor criticisms can be raised. Table IV may well have been arranged in alphabetical order. On page 170 the headings "Esposito Type" and "Valbuzzi Type" have been transposed. On page 290, Derrick is reported as finding *Leptospira canicola* in two Victorian patients, whereas both patients lived in North Queensland.

The book can be thoroughly recommended to all who are interested in leptospirosis. It will be regarded as the standard work on the subject, though new knowledge is accumulating at such a rate that another edition will be called for in a few years.

New Biology. Edited by M. L. Johnson, Michael Abercrombie and G. E. Fogg; No. 26; 1958. Victoria: Penguin Books Proprietary, Limited. 7" x 4", pp. 128, with illustrations. Price: 4s.

MEDICAL READERS of this number of *New Biology* are more particularly likely to be interested in the detailed and fascinating description of the hen's egg in an article entitled "New (and Better?) Parts for Old", which deals particularly with those animals that have the capacity to regenerate parts of their bodies that they have lost, and in a discussion on cybernetics and biology. Other articles deal with the buttercup, conservation as a world problem, nature conservation in Britain and peat bogs. A number of short reviews of recent biological books are also included.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Management of Emergencies in Thoracic Surgery", by John Borrie, M.B.E., Ch.M., F.R.C.S., F.R.A.C.S.; 1958. New York: Appleton-Century-Crofts, Inc. 9½" x 6½", pp. 352, with many illustrations. Price not stated.

The author is Senior Lecturer in Thoracic Surgery in the University of Otago Medical School, New Zealand.

"Rehabilitation in Industry", edited by Donald A. Covalt, M.D. "Modern Monographs in Industrial Medicine." Editor-in-Chief, Anthony J. Lanza, M.D.; Consulting Editor, Richard H. Orr, M.D. 1958. New York and London: Grune and Stratton, Inc. 8½" x 5½", pp. 168, with many illustrations. Price: $6.00.

A symposium with eleven contributions.

"Human Dissection: Its Drama and Struggle", by A. M. Lassek, M.D., Ph.D.; 1958. Springfield, Illinois, U.S.A.: Charles C. Thomas, Publisher. 9" x 6⅝", pp. 320, with 13 illustrations. Price: 50s.

The story of human dissection from the earliest times with particular reference to the problem of obtaining cadavers for the purpose.

"Summary of Health and Vital Statistics", U.S. Department of Health, Education and Welfare. Public Health Service, Washington: National Office of Vital Statistics. 11" x 8½", pp. 28, with many illustrations. Price not stated.

A compendium of the highlights of statistics for the United States most commonly used for answering inquiries.

"Theory of Psychoanalytic Technique", by Karl Menninger, M.D., Menninger Clinic Monograph Series, No. 12; 1958. London: Imago Publishing Company, Limited. 9½" x 5¾", pp. 224. Price: 25s. (English).

"This book is about theory—the theory of the therapy."

"Practical Blood Transfusion", by J. D. James, M.R.C.S., L.R.C.P., with a foreword by P. L. Mollison, M.D., F.R.C.P.; 1958. Oxford: Blackwell Scientific Publications. 9" x 5½", pp. 192, with seven illustrations. Price: 20s. (English).

The author is Director of the North London Blood Transfusion Service.

"Clinical Endocrinology", by Karl E. Paschkis, M.D., Abraham E. Rakoff, M.D., and Abraham Cantarow, M.D.; 1958. Second Edition. New York: A Hoeber-Harper book. 9½" x 5¾", pp. 948, with 199 illustrations and 48 tables. Price: $18.00.

Much new material has been added since the first edition appeared in 1954.

The Medical Journal of Australia

SATURDAY, JANUARY 3, 1959.

THE MATRIX OF MEDICINE.

MANY thoughts, distinct yet closely linked, cluster around the idea of the matrix. The Oxford English Dictionary sets them out. The matrix is the rock-mass surrounding or adhering to things embedded in the earth, as metal, fossils and gems. It is the mould in which printers' type is cast. It is the substance lying between living cells. It is the womb in which the child is formed. Each image adds something to the whole meaning of a word of wide application, for many things including medicine have in some sense a matrix. According to Nicholas Malleson, editor of a recent and thoughtful book on "The Matrix of Medicine",[1] the several disciplines of medicine are embedded in a social matrix. At its centre a discipline may be concerned only with basic scientific truths, but at its periphery, where it comes to be applied to human beings, it is necessarily shaped by the mould of society. "Every branch of medicine has its social interface." Many practical examples could be quoted of this, but those given by Malleson show the idea:

> No physician can treat a diabetic without reference to how he earns his living; the management of a young married woman with mitral stenosis depends on her religion; studies in the pathology of atheroma give weight to differences of diet in the different social classes; nothing is gained by putting a school into quarantine if the mothers of the district pack the children into the cinema instead. Every branch of medicine is touched by the ramifications of society and social custom.

Society is thus the matrix of medicine, and to present it in more detail Malleson has gone to a group of ordinary doctors, mostly clinicians, with varying interests. They in turn discuss the social aspects of health education, the role of the family doctor, nursing, maternity and child welfare, the student health service, industrial medicine, the climacteric in men and in women, geriatric care, somatopsychics, nutrition, mental deficiency and its prevention, chest disease and the home care of sick children. Some of the details apply more especially to the United Kingdom, but the composite picture is that of medicine everywhere in its social environment. We need not linger over the individual presentations, though they may be commended for detailed study. Our main concern is to emphasize with Malleson the truth that "social medicine is not really an independent subject at all". It is an approach, "inherent in, not separate from the ordinary practice of medicine". The establishment of this concept has not been easy. The pioneers of social medicine have been often as much misunderstood as their subject. It has been mixed up with socialized medicine, and political motives have been attributed to its exponents because they have inevitably been concerned with the medical implications of unsatisfactory social conditions. Malleson points out that a miscellany of unrelated topics has been laid at the doorstep of social medicine—"psychosomatics, the political wrangles about health centres in the N.H.S., 'positive health', the doctor-patient relationship, the epidemiology of non-infectious disease, the new-look of preventive public health struggling to emancipate itself from the water closet, psychiatric illness in industry, employability, and a host more"; and then quite illogically it has been ridiculed as "an upstart, too big for its boots", and dismissed as a fad. True enough, those with a special interest in the social aspects of medicine have developed particular methods of study, and separate departments and institutes of social medicine have grown up. Malleson emphasizes, however, that this separation has been forced upon social medicine; ideally, it should have had no separate existence.

Probably departments of social medicine will continue to develop in the academic world, concentrating on particular problems, but, more importantly, bringing to medicine a constant reminder of the living mould in which it is formed. Cicely Williams[1] has set out in the Milroy Lectures for 1958 an absorbing and challenging picture of social medicine in developing countries. There society is in an obvious state of flux, and it does not yet appear what will be the pattern of medicine cast in this matrix. We certainly may not assume that it will conform wholly to Western ideas, nor is it desirable that it should. Indeed, we may well consider whether we are not assuming too much about the future pattern of medicine in Western countries. Society is undergoing major changes, which in the nature of things will mould medical practice; although this is not meant to imply that we should acquiesce passively in the changes that will be forced upon us, as they are sought to be forced upon society as a whole, by certain doctrinaires in the political and social fields, and indeed even in medicine. In the latter regard, passing reference may be made to a refreshing article by I. Gordon[2] with the title "That Damned Word Health", which, even if it swings the pendulum rather too far in the opposite direction, is a healthy corrective to some current woolly talk about "positive health". Among the really important factors in the contemporary picture we may point to a few: the staggering developments taking place in technology, for good as much as for the ill with which we find it hard not to be obsessed; the growing awareness of international influences and obligations which, if only by the accident of geography, must concern us increasingly in Australia; the uneasy feeling that a purely material view of man is not enough; and so on. These are the influences bearing on contemporary society, and so on medicine. One important point, however, remains to be stressed; the relationship of medicine to its matrix is not just that of the metal type to its mould, of the lifeless

[1] "The Matrix of Medicine: Some Social Aspects of Medical Practice", edited by Nicolas Malleson, M.D., M.R.C.P.; 1958. London: Pitman Medical Publishing Company, Limited. 8½" × 5", pp. 354. Price: 67s. 6d.

[1] *Lancet*, 1958, 1: 863 (April 26), 919 (May 3).

[2] *Lancet*, 1958, 2: 638 (September 20).

fossil or gem to its earthy encrustation, or even of the growing child to the womb. It is, or should be, an active, living, mutual relationship, a cooperative interaction aimed at achieving the good of the whole. If society would seem to be unwieldy and impersonal, exerting blind force or transmitting the influence of those who are strong but not always scrupulous, there is all the more reason for the medical profession to hold firmly to its ideals, to take honest stock of itself and its preconceptions, and consciously to exert its own moulding influence on society. This is a heavy responsibility requiring much sincerity and wisdom. We have no grounds to be smug about modern medicine, no matter how far we may think we have come. Malleson's comment is sobering and challenging as we face a new year.

> The prospect before medicine this next half century is to face up to the fact that the conquest of disease has not proved to be the conquest of suffering. We must devise new methods and new attitudes to meet a new need.

Current Comment.

THE VALUE OF CARDIAC PATIENTS IN INDUSTRY.

THERE have been considerable changes over the years in opinions as to the amount of work which can be done by patients with various cardiac diseases. It is generally held now that such patients do better with limited exercise than with complete or almost complete rest. The place of cardiac patients in industry has been the subject of many recent papers, but there appears to have been no controlled study to evaluate the effect of competitive industrial activity on the diseased heart such as that now reported by A. Slipyan.[1] He refers to the finding by another group of investigators that employers are reluctant to hire persons with cardiac disease even if they do not have a definite policy against it. Reasons for the reluctance in hiring these persons are reported to be that the physical demand of work exceeds the physical capacity of the cardiac patient, that there is a risk of monetary loss arising out of compensation claims, that cardiac patients are a heavy burden on company-sponsored insurance programmes, and that there is insufficient medical staff.

Slipyan shows that many of these reasons can be discounted. His study covered ten patients with post-myocardial infarction who had a history of one or more attacks and had varying degrees of myocardial decompensation, seven with rheumatic heart disease and two with hypertensive heart disease; the period of study was mostly over a year. All these subjects would be considered unemployable in industry. They were employed by Abilities, Inc., of Long Island, New York, in a wide range of types of work, mostly bench work, electrical or mechanical.

Abilities, Inc., is a unique organization. Founded in 1952 with four employees, it now employs over three hundred persons in the manufacture of electronic instruments. Of the employees 65% work from wheel-chairs. The yearly payroll is over half a million dollars. Attendance and safety records are better than the national averages. With an original capital of $8000 it now has assets of well over one million dollars.

Many of the subjects in this study of cardiac patients were physically active as far as walking is concerned; none of them did any hard labour. They all travelled some distance by car through heavy traffic daily, either as drivers or as passengers. The study showed that five of the ten with post-myocardial infarction had shown no change since being employed, three had shown definite improvement, one had died from a stroke after heavy exertion not at work, and one had had an increase in anginal attacks but no increase in disability. Four out of the five persons with anginal attacks had decidedly improved. The seven employees with rheumatic heart disease with some degree of valvular deformity carried out the same type of work as that of the infarction subjects and had similar exercise. One subject only had been absent from work for a short period, two had shown definite improvement, and five had shown no change. All were under usual medical treatment. The two patients with hypertensive heart disease did sitting work and had shown no marked change in their condition over a period of more than a year.

It is to be noted that these persons, as indeed all the employees of Abilities, Inc., are not engaged in menial unskilled jobs, but are mostly operating modern complex machinery. The financial success of Abilities, Inc., is evidence of the productivity of the employees. The maintenance of excellent attendance records and the absence of any reported case of compensable injury are directly contrary to the stated reasons given by industry for not employing cardiac patients. Employment had no detrimental effect on the disease, but a remarkable improvement was exhibited by some of the employees. It seems that the validity of some of the present concepts, practices and prejudices relating to employment of persons severely disabled by cardiac diseases needs investigation. As Slipyan says, employment in a compatible job can, in the specific case, be beneficial.

[1] *J.A.M.A.*, 1958, 168: 147 (September 13).

PROBLEMS IN ELECTROCARDIOGRAPHY.

THE serious student of electrocardiography is puzzled and confused. American, Swiss and English writings on the subject have practically no points in common. Even to pick up one learned American treatise on the subject, and to compare it with another from the same country, is like having two cook books, one in Chinese and the other in Italian.

As a reaction from the facile and inaccurate unipolar pattern electrocardiography, academic electrocardiographers like Charles E. Kossman have, in an attempt to illuminate the basic facts of the subject, instituted a series of lectures at the New York University Bellevue Medical Center. These are now available in book form,[1] and as the preface warns, deal with the fundamental science of electrocardiography and do not necessarily have direct clinical application. Subjects dealt with include biolectrics of the myocardial cell, the electric field of the heart, the spread of excitation and cardiac rhythms. The chapters are written by five members of the New York Faculty of Medicine, and on no occasion is the wind tempered to the shorn medical lamb. Equations and graphs are presented with the object of helping the student to come to grips with some of the latest scientific bases of electrocardiography. The book is too advanced for the novice, but it is a valuable contribution in its field. While there may be no immediate practical application of much that is said, it is essential that this work go on, and that the fallacy of much uncontrolled experimental work that appears in the world literature be exposed.

In the chapter dealing with bundle branch block, four types of intraventricular activation are discussed. These are recognizable both in normal and in pathological states, and a word of warning is given that "it is impossible both at the present time and in the foreseeable future to define with accuracy the dividing line between physiologic and pathologic forms, unless changes develop in serial electrocardiograms that can be correlated with certainty with

[1] "Advances in Electrocardiography", edited by Charles E. Kossman, B.S., M.D., Med.Sc.D., F.A.C.P.; 1958. New York and London: Grune and Stratton. 9" x 5¾", pp. 288, with many illustrations. Price: $9.75.

other objective manifestations of heart disease". This warning comes at a time when many practitioners are interpeting their own tracings. If the clear-cut patterns of infarction and obvious arrhyrthmias were the only ones upon which an opinion was given, little harm would ensue. The danger arises in ascribing heart disease to an individual with some type of conduction defect or slight *S-T* change, the meaning of which is still debated by the very elect. It is worth remembering Wilson's admonition: "Electrocardiographic abnormalities are not diseases."

IS THE LARGE MENTAL HOSPITAL BANKRUPT?

> The large mental hospital is antiquated, outmoded and rapidly becoming obsolete. We can still build them, but we cannot staff them; and therefore we cannot make true hospitals of them. . . . I do not see how any reasonably objective view of our mental hospitals today can fail to conclude that they are bankrupt beyond remedy. I believe, therefore, that our large mental hospitals should be liquidated as rapidly as can be done in an orderly and progressive fashion. . . .

THE author of this opinion was Harry C. Solomon, the superintendent of one of the foremost mental hospitals of its type, the Massachusetts Mental Health Center (Boston Psychopathic Hospital). He was delivering his presidential address to the one hundred and fourteenth annual meeting of the American Psychiatric Association, held in 1958. The audience consisted largely of psychiatrists, many of whom were responsible for the operation of the hospitals under discussion. Reports coming from America do not indicate whether the superintendents of the large hospitals were particularly surprised to hear their own liquidation recommended by the president of their association. The situation is not without humour, of the sort evident in the celebrated "Statement to Shareholders" of the Adelaide brewery which failed a few years ago: "Our beer was generally terrible and unacceptable to the public. It is surprising we stayed in business so long."

Few shareholders in the large mental hospital of 1958 continue to be fascinated by the possibilities of therapy in this institution. Despite its humanitarian origins, the large mental hospital turned out in practice to be a good arrangement for cheap custody combined with a high degree of concealment. If a society develops a strong demand for therapy, the large mental hospital will give way to some extent to more modern alternatives—some of which are as old as history—and these include the small mental hospital. In Australia, the large mental hospital seems to be as insolvent as its American counterpart, if the 1955 Stoller Report can be taken seriously. Fortunately for this country, increasing numbers of our young psychiatrists are going abroad to study principles of public mental health. The latest investigator is Dr. David Maddison, of New South Wales, extracts of whose report are quoted in the current (December) number of *The Australasian Psychiatric Bulletin*: ". . . the available evidence clearly indicates that the optimum size for the future mental hospital should be approximately 300 beds, and in any case should never exceed 500 beds. . . . There is an almost universal trend in favour of the development of small regional hospitals, located close to and as integral parts of general medical facilities . . . the sheer fantasy that the medical superintendent of a large mental hospital can and should have personal knowledge of every patient in his wards should not be allowed to persist. . . . The most advanced practice indicates clearly that hospitals should be composed of small buildings rather than a single block, each building planned for 20 to 30 patients."

Who defends our present system of the care of long-term mental illnesses? The medical profession is probably prepared to take its share of responsibility for this system, by persisting too long with the stereotype of treating illnesses in big hospitals. The medical profession has acted sincerely, but in this instance has been the unwitting servant of a culture which wanted to conceal the problem of mental illness, and to handle it with maximum cheapness, by means of the large mental hospital. The "tranquillizers" came at an unfortunate time, just as a usefully explosive situation was developing in these institutions. With their well-known effect of damping down the irritability associated with overcrowded handling of patients, they may have deferred the day of Dr. Solomon's proposed "liquidation". The forces preserving the large mental hospital are powerful and cannot be under-estimated. The President of the American Psychiatric Association may be correct in inferring that the hospitals are bankrupt; but it does not seem likely that they will be liquidated whilst these forces persist. However, there are happy signs that our Australian society is sharing the western world's recent inclination towards therapy rather than custody of long-stay mental patients. Certainly it may be said that those on both sides of the dispute, custodians and therapists, agree on one principle: it will probably never be possible to raise the large asylums, with their inevitable problems, including the procuring of good staff, to modern medical standards. The Stoller Report was a statement of the insolvency of our large mental hospitals. People who doubt that solvency was ever a reasonable possibility in such institutions would value another report to spell out the alternatives. Such a report would come at a good time now, when there is widespread questioning whether our asylums must be perpetuated merely because they have been inherited.

THE PROPHYLACTIC USE OF GAMMA GLOBULIN.

IMPORTANT COMMENTS on the prophylactic use of gamma globulin are contained in a letter received recently from the Chairman of the National Health and Medical Research Council, Dr. A. J. Metcalfe. He states that at its forty-fourth session in Sydney on November 14, 1958, the National Health and Medical Research Council recommended that wide publicity be given to the value of gamma globulin in the prophylaxis of infectious hepatitis. In the absence of any new laboratory development permitting the identification and cultivation of the virus of hepatitis, the only available measure of control, apart from general hygiene, is that afforded by the passive protection of contacts by gamma globulin. Before the introduction of poliomyelitis vaccine the limited supplies of gamma globulin available were as far as possible conserved for use in the prophylaxis of poliomyelitis and infectious hepatitis. Since the mass immunization campaigns against poliomyelitis have been conducted by the States the restrictions upon the issue of gamma globulin have been removed, but medical practitioners generally seem still to be under the impression that it can be obtained only with considerable difficulty and for purposes dictated by a strict system of priority. It is therefore important to emphasize that all restrictions upon the availability of gamma globulin have been removed, and it is now available from Commonwealth Directors of Health in every State on request of a medical practitioner, free of charge. The National Health and Medical Research Council has recommended that State Departments of Health establish depots in country districts from which practitioners may draw supplies of gamma globulin without the difficulties and delays attending dispatch from the capital cities. The pamphlet on gamma globulin prophylaxis and dosage issued by the Commonwealth Serum Laboratories has been redrafted and is reprinted elsewhere in this issue (see page 30).

HALF-YEARLY INDEX TO "THE MEDICAL JOURNAL OF AUSTRALIA".

THE index to THE MEDICAL JOURNAL OF AUSTRALIA for the half-year ended June 30, 1958, is now available. All readers of the Journal who do not usually receive the index and wish to do so are asked to write to the Manager, The Printing House, Seamer Street, Glebe, N.S.W.

Abstracts from Medical Literature.

PATHOLOGY.

Prognosis in Cancer of the Lung.

F. C. COLLIER *et alii* (*A.M.A. Arch. Path.*, October, 1958) analyse the clinical and pathological data on 226 consecutive resected lung carcinomata. All cases were followed up. The most important factor influencing prognosis was found to be the presence or absence of blood vessel invasion. Only 6% of patients whose tumours had invaded blood vessels were alive at the end of five years, while 72% of patients whose tumours were not associated with vascular invasion survived five or more years. By rigidly limiting the term "undifferentiated carcinoma" to those malignant epithelial tumours in which differentiation in any known direction could not be shown, and by utilizing histochemical techniques to reveal occult evidence of differentiation, they considerably reduced the percentage of undifferentiated tumours in this series. No patient with an undifferentiated carcinoma so defined survived for five years. All of the tumours in this group were associated with vascular invasion, usually of striking degree. Tumours can be considered as localized only if there is no evidence of extension of the tumour beyond the confines of the primary site. The factors excluding a tumour as localized include peripulmonary and parapulmonary invasion, tumour in the lines of resection, and tumour in regional lymph nodes. The most frequently missed excluding factor is vascular invasion. The importance of accurate definition of and strict adherence to the term "localized tumour" is shown by the survival for five years of 94% of patients who had a tumour so designated.

Partial Hepatectomy in Cirrhosis of the Liver.

A. H. ISLAMI, G. T. PACK AND J. C. HUBBARD (*Cancer* (*Philad.*), July-August, 1958) caused cirrhosis of the liver in rats by the administration of carbon tetrachloride. In some of the rats with cirrhosis produced by this means, a 70% partial hepatectomy was performed. Partial hepatectomy in rats with advanced cirrhosis was followed by regeneration of the liver with normal architecture and gain in weight, whereas rats in the control series had ascites and no weight gain. The authors consider that because of the markedly similar pattern in human cirrhosis to that produced in rats by carbon tetrachloride, there may be a place for partial hepatectomy in the treatment of the human disorder.

Marrow Plasmocytosis.

W. D. NICOLL, A. J. WATSON AND J. W. WHITELAW (*J. clin. Path.*, September, 1958) describe two cases of marrow failure with massive marrow plasmocytosis simulating myelomatosis. Both patients presented with severe anæmia and granulocytopenia. In each case the bone marrow was found to be infiltrated by plasma cells; there was rouleaux formation, a high erythrocyte sedimentation rate, and hyperglobulinæmia. These features naturally suggested myelomatosis, but in neither case was Bence-Jones protein demonstrable. In secondary plasmocytosis there is no increased cellularity of the marrow, and the plasma cells have merely taken the place of the normal marrow elements. In myeloma there is a replacement of fat by sheets and clumps of plasma cells. This illustrates the value of histological examination of bone marrow fragments in separating the two disorders.

Skin Petechiæ in Fatal Coronary Disease.

L. M. GERLIS (*J. clin. Path.*, September, 1958) describes eight cases in which cutaneous petechiæ were found at necropsy on patients who had died of acute coronary insufficiency. The petechiæ occurred in areas commonly associated with referred cardiac pain. It is suggested that the presence of such localized petechiæ is supporting evidence of acute coronary insufficiency, particularly in those cases where the coronary arteries themselves show no recent culpable organic lesion. In four of the cases hæmorrhagic lesions were found in direct relationship to the coronary arteries. The mechanism is discussed and the possible role of reflex activity in the ætiology of subintimal coronary hæmorrhages is considered.

Needle Biopsy of Pleura.

M. L. SAMUELS, J. W. OLD AND C. D. HOWE (*Cancer* (*Philad.*), September-October, 1958) have used the Vim-Silverman needle to obtain biopsy specimens from 52 patients with malignant pleural effusions. In 50 of these patients the fluid also was examined for neoplastic cells. Diagnostic tissue was obtained in 25 pleural biopsy specimens, whereas 18 of 38 cases of metastatic carcinoma gave a positive result on cytological examination of pleural fluid. In 14 examples of lymphoma, 11 specimens of pleural fluid yielded suggestive results. There were 10 cases in which the findings on pleural biopsy were positive while on cytological examination they were negative. The biopsy technique gave the best results with bronchogenic carcinoma (57%) and the poorest in malignant lymphoma (36%). In seven cases there was atypical fibrosis which the authors consider to be suggestive of a malignant origin of the pleural fluid. There was no associated morbidity.

Melanoma.

N. LANE, R. LATTES AND J. MALM (*Cancer* (*Philad.*), September-October, 1958) present a surgical pathological study of malignant melanoma of the skin of adults undertaken to correlate the follow-up results of several types of surgical treatment with the pathological findings. The treatment consisted of (i) excision of only the primary tumour; or (ii) excision of the primary tumour *plus* simultaneous elective, or so-called "prophylactic" node dissection; or (iii) excision of the primary tumour *plus* simultaneous or delayed radical dissection of clinically evident nodal metastases. Since two-thirds of the recurrences after treatment took place within two years, and 80% within five years, the apparent five-year cure rate appeared to be a reasonable measure of the effectiveness of treatment. The authors came to the following conclusions: (i) Metastatic deposits were found in a significant proportion (42%) of so-called "prophylactic" lymph node dissections. Meticulous examination of lymph nodes, including a study of serial sections in some cases, was required to discover some microscopically minute metastases. (ii) The remarkably favourable apparent five-year cure rate (60%) in these patients contrasts with the poor prognosis for those patients having node dissection for clinically evident nodal metastases; for the latter, the five-year cure rate was only 10%. (iii) Some patients who were treated by excision of only the primary tumour without "prophylactic" lymph node removal subsequently showed reappearance of disease. A clinically evident regional lymph node metastasis was almost always their first sign of recurrence. "Prophylactic" node dissection in these cases would have removed nodal metastases while still minute, with a relatively favourable prognosis. (iv) Although there are spectacular exceptions, pathological study disclosed that patients with melanomata two centimetres and less in diameter had an apparent five-year cure rate of 61% as opposed to a 16% rate in patients with melanomata more than two centimetres in diameter. (v) There was a markedly favourable prognostic significance associated with a pathological feature termed "lateral junctional spread". This term describes the presence of malignant melanoma cells in "junctional" and intraepidermal positions, peripheral or "lateral" to the central more deeply invasive portion of the growth. This feature appears to reflect a tendency towards a restrained superficial type of growth.

Pulmonary Megakaryocytes.

J. G. SHARNOFF AND E. S. KIM (*A.M.A. Arch. Path.*, August, 1958) have observed megakaryocytes in the lungs of various mammals. In humans they have been seen as early as in five months old fœtuses and in both normal and diseased persons of various ages. The authors conclude that megakaryocytes are transported in the venous system from bone marrow to the pulmonary capillary bed, where they are broken up to form platelets. They found that larger numbers of megakaryocytes appeared in the pulmonary vascular bed in post-operative and infectious states, in thrombo-embolic disease, and in severe anæmias.

Melanoma of Oral Cavity.

A. P. CHAUDHRY, A. H. HAMPEL AND R. J. GORLIN (*Cancer* (*Philad.*), September-October, 1958) review 105 examples of malignant melanoma of the oral cavity. This neoplasm seems to occur more often in men than in women. Nearly 75% of the patients were more than 40 years of age; the average age was 50·5 years. The palate, the alveolar mucosa, and the soft palate, in that order of frequency, were most commonly involved. In nearly 30% of the cases there was oral pigmentation at the site at which the neoplasm originated. This pigmentation had appeared from a few months to several years before the tumour. The disease has been reported in all races. In more

than 50% of 93 cases clinical evidence of lymph node metastases was recorded. In 19 cases there was clinical or radiological evidence of generalized metastases. Of the 61 patients followed up, 51 had died of the disease. In 24 cases, the survival period averaged 18·5 months after diagnosis. There were only three patients who had lived for more than five years after removal of the tumour. The authors point out that the appearance of melanin pigmentation in the mouth and an increase in the area involved and in its depth of colour should be viewed seriously.

Gastric Osteodystrophy.

H. SELYE (*Amer. J. Path.*, March-April, 1958) reports that he has experimentally produced nephrocalcinosis in the rat by the formation of a gastric fistula. Pronounced histological changes were also found in all bones examined. These were indistinguishable from the osteitis fibrosa which can be produced in the rat by large doses of parathyroid hormone or by total nephrectomy. This condition is considered to represent a "gastric osteodystrophy".

THERAPEUTICS.

Digoxin in Childhood.

A. HAUCK *et alii* (*Amer. Heart J.*, September, 1958) in the course of treating 86 children with digoxin, found that the dosage required for digitalization of patients up to the age of two years was about 0·04 milligramme per pound of body weight in 24 hours. Children over two years of age required about 0·02 to 0·03 milligramme per pound of body weight. Maintenance in both groups could be achieved, generally, by the daily administration of one-third of the digitalizing dose. However, great variation in response to digitalis, weight for weight, was encountered, so that it is recommended that digoxin should be administered until a therapeutic effect is achieved, or intoxication appears.

Quinidine.

E. M. VAUGHAN WILLIAMS (*Lancet*, May 3, 1958) reports the results of an investigation into the mode of action of quinidine by studying the intracellular potentials of single cardiac fibres when exposed to varying concentrations of the drug. The author concludes that quinidine acts by affecting the phase of depolarization, without necessarily prolonging the duration of the phase of polarization.

Penicillin Allergy.

F. O. WARREN (*J. Amer. med. Ass.*, June 7, 1958) describes a new treatment for allergic response to penicillin. The allergy may cause erythema, itching, giant urticarial weals or polyarthritis of many months' duration. Antihistamines and steroids are not very satisfactory in the treatment. The author used "Pabalate", a composition of 300 milligrammes each of sodium salicylate and sodium *p*-amino benzoate with 50 milligrammes of ascolic acid in each tablet, one tablet to be taken four times daily. Within 48 hours in one case the arthritis, weals and hives had disappeared. After this the same treatment was used in nine other patients with similar results. It is said that salicylates have an action similar to that of ACTH and cortisone. *P*-amino benzoate taken orally was successful in treating serum sickness after diphtheria antitoxin in 34 infants, and it has been shown that this drug enhances the effect of salicylates. Vitamin C corrects the capillary fragility in scurvy, and it is said that there is a relationship between vitamin C and the corticosteroids. Further trials of "Pabalate" are advised.

Salicylamide and Acetylsalicylic Acid in Infants.

A. J. VIGNEC AND M. GASPARIK (*J. Amer. med. Ass.*, August 9, 1958) report on a comparison of the antipyretic effectiveness of salicylamide and acetylsalicylic acid in infants. They state that there is a search for therapeutic agents which would possess the antipyretic and analgesic effects of acetylsalicylic acid without some of its undesirable attributes. In pædiatric work two of these undesirable attributes are taste and the difficulty in preparing a stable liquid preparation for infants who cannot take medicament in tablet form. Patients with temperatures over 101° F., in whom it was thought that antipyretic measures alone would suffice to control the illness, were treated with either salicylamide or acetylsalicylic acid. The results indicated that both drugs controlled pyrexia equally well and with the same number of doses. With both drugs the need for additional measures bore a direct relationship to the height of the temperature at the beginning of the illness. In the authors' experience, the salicylamide suspension was superior to aspirin in ease of administration, better acceptability and control of dosage. A further advantage is that salicylamide is less toxic than aspirin, as indicated by animal experiments. No toxic reactions were encountered in this study, and the authors state that it is difficult to see how a child might ingest a dangerous amount of salicylamide. For these reasons they consider that salicylamide suspension has definite advantages for use in young children.

Triamcinolone.

E. F. HARTUNG (*J. Amer. med. Ass.*, June 21, 1958) reports on his experience with triamcinolone in the management of rheumatoid arthritis. He states that corticosteroid therapy in the management of rheumatoid arthritis should be undertaken only after serious consideration of the potentialities of the steroid used, its side effects, and other risks involved. He suggests that it should be considered in four situations only: (i) when the disease does not promptly respond to adequate salicylate therapy; (ii) when it is not possible to maintain the patient in reasonable comfort by means of rest, corrective exercises, salicylates and occupational therapy; (iii) when gold salts fail after an adequate trial; (iv) as a temporary measure during some orthopædic and rehabilitative procedures. The author finds that triamcinolone has four important advantages over other steroids in almost all cases: (i) absence of œdema; (ii) fewer gastro-intestinal symptoms, particularly as regards the peptic ulcer syndrome; (iii) less psychic irritation; (iv) no effect on arterial blood pressure. Triamcinolone was found to be effective in doses roughly proportional to those of prednisone and prednisolone. Its effect was established more slowly, but at the same time unwanted side-effects were slower in asserting themselves. However, triamcinolone was found to retain many of the disturbing side-effects of other corticosteroids, in particular their masculinizing effect, facial rounding, cutaneous ecchymoses and acne. Increased sweating and leg cramps were prominent.

W. B. SHELLEY, D. M. PILLSBURY AND J. S. HARUN (*J. Amer. med. Ass.*, June 21, 1958) report on the results of a trial of triamcinolone in the treatment of psoriasis and other dermatoses. In a series of 60 patients with psoriasis, 36 were found to respond rapidly and dramatically to a dose of from 12 to 16 milligrammes of triamcinolone daily. Relapse invariably occurred when therapy was suspended. Triamcinolone used topically was without effect. The authors recommend considerable conservatism in initiating such therapy, and now reserve it for acute extending psoriasis not controllable by other means, and for very extensive and severe chronic psoriasis. They also found that triamcinolone had potent anti-inflammatory properties in the treatment of various other dermatitides.

Chelating Agents in Hæmochromatosis.

L. LANGERON, M. PAGET, L. CROCCEL AND G. ROUTIER (*Presse méd.*, July 12, 1958) present the results of treatment of hæmochromatosis with the disodium salt of ethylene diamine tetra-acetic acid. The patients were affected by the disease in varying degrees, as shown by clinical and laboratory observations. One patient died, and the other two were greatly improved. The early application of this form of treatment probably prevents the storage of iron in the viscera by aiding in its elimination; but the chances of the agent's taking up fixed iron pigment are limited. No untoward effects were noted during two years' treatment of one patient, in spite of the coexistence of severe diabetes.

Novobiocin.

P. BAIL (*Sem. Hôp. (Paris)*, November, 1957) reports the results of trials with novobiocin, a new antibiotic with remarkable anti-staphylococcal properties. It is also effective against the pneumococcus, and the Gram-positive bacteria in general, with the exception of streptococci, which are frequently resistant to it. It has some effect on *Proteus*, but is inactive against other enteric bacteria. Novobiocin is administered by mouth in 20-milligramme tablets at the rate of two grammes per day in adults, preferably in fractional doses every six hours, and for children the dosage is 30 milligrammes per day per kilogram of body weight. Novobiocin is rapidly absorbed by the intestines, and its toxicity is very low. Toxic side-effects are few and are of an allergic character, manifested by macular or papular eruptions. Bacterial resistance to novobiocin may be acquired, but this does not affect the sensitivity to other antibiotics, and novobiocin can often be combined efficaciously with penicillin and the tetracyclines.

Brush Up Your Medicine.

ANTIMALARIAL DRUGS AT PRESENT IN USE FOR THE PREVENTION AND TREATMENT OF MALARIA.

ANTIMALARIAL DRUGS are commonly used: (i) to prevent malaria attacks, in which case they are taken regularly and are known as suppressives; (ii) to treat an attack of malaria (overt malaria); (iii) to eradicate relapsing vivax malaria, either after an overt attack or during (presumed) latency; (iv) to destroy the sexual forms (gametocytes) of *Plasmodium falciparum* when this is considered to be necessary.

Drugs Used for the Prevention of Malaria.

Suppressive drugs rely for their effect upon a constantly maintained minimum concentration in the blood. This can be maintained only by absolute regularity in their use. The dosage schedules given here have been carefully determined and are effective if followed. This should be pointed out to people who seek advice on antimalarials before they go to a malarious country. The difficulty of maintaining regular consumption of a drug should be realized, and it is suggested that a person taking a suppressive should make an entry in a diary or a mark on a calendar as each dose is taken. Parents should be aware that they are responsible for giving suppressives regularly to their children.

In very many cases it is not sufficient merely to prescribe tablets and to expect the person to take them regularly. Pointing out the possible consequences of a severe attack of falciparum malaria may persuade some that it is desirable to take their drug regularly, but often personal experience of such an attack is necessary before the advice is heeded. Much depends upon the attitude of the expatriate European population: if there is no social stigma attached to an attack of malaria even in a child, if malaria is regarded in the same way as a common cold, then there is little incentive to prevent an attack by the regular use of suppressives.

Drugs used for suppression fall into two groups—those taken daily and those taken weekly. Some will find a daily habit and others a weekly habit more readily adopted.

Proguanil ("Paludrine") is used in daily doses of 100 milligrammes (one tablet). Infants can be given daily doses of 25 milligrammes, crushed and mixed with a little honey or other acceptable excipient. The daily dose for children aged from one to six years is 50 milligrammes, from seven to ten years it is 75 milligrammes every day, and from ten years onwards the adult dose may be taken.

Drugs used weekly should be taken on the same day of each week. It may be possible to link the taking of the drug with some other weekly habit which is already established. The drugs used for weekly administration and their dose are as follows:

Amodiaquine ("Camoquin"): two tablets (400 milligrammes of base) on the same day of every week. Infant formula "Camoquin" is available for children.

Chloroquine ("Aralen", "Avlochlor", "Nivaquine", "Resochin", etc.): two tablets (300 milligrammes of base) on the same day of every week.

Hydroxychloroquine ("Plaquenil"): two tablets (300 milligrammes of base) on the same day of every week.

Pyrimethamine ("Daraprim"): one tablet (25 milligrammes) on the same day of every week.

To lessen the chances of gastric upset it is advisable to suggest that the drug selected for use be taken after a meal. It is not necessary to take any of these drugs before arriving in a malarious country, but if they are taken for, say, a fortnight before leaving Australia for New Guinea, then any possible sensitivity to a particular drug may be revealed and another drug substituted. The suppressive should be taken throughout the period of residence in a malarious country and for a month after leaving it. While the drug is being taken regularly there will be no disability whatsoever attributable to malaria. When the suppressive is discontinued an overt attack of vivax malaria may appear, but there will be no risk of falciparum malaria developing.

Drugs Used for the Treatment of Overt Malaria.

In the usual case of an overt attack of malaria, oral therapy with either amodiaquine or chloroquine will result in a rapid disappearance of symptoms.

The doses are as follows:

Amodiaquine:

Day 1: Three tablets (600 milligrammes of base) at once.

Day 2: Two tablets.

Day 3: Two tablets.

Chloroquine:

Day 1: Four tablets (600 milligrammes of base) at once, two tablets later.

Day 2: Two tablets.

Day 3: Two tablets.

There is little to choose between the effectiveness of these two drugs; both are superior to quinine, especially in heavy falciparum infections. In the usual case of vivax malaria seen in Australia, in which the infection has been acquired in New Guinea, the patient is usually able to resume his usual activities on the second or third day of therapy.

In cases in which there is persistent vomiting, and in falciparum malaria when there is a heavy infection or when cerebral complications occur, chloroquine should be given by intramuscular injection in a dose of 400 milligrammes of base for an adult, repeated in eight to twelve hours if necessary. If this drug is to be given to infants or young children it should be given on a strict dose-for-weight basis: five milligrammes of chloroquine base per kilogram of body weight. Overdosage can have fatal results. Various brands of chloroquine for injection are supplied in different concentrations and in the form of different salts of chloroquine, so that the dose must be calculated on the basis of chloroquine base content.

Some patients with severe falciparum infections are seen in a state of medical shock. Here the treatment of shock calls for emergency measures to sustain the patient, so that he will remain alive while the antimalarial drug is having its effect. In these cases chloroquine may be given by adding it to a drip infusion. Noradrenaline may be useful in these cases.

Severe cases of falciparum malaria constitute a medical emergency demanding prompt and personal attention on the part of the physician.

Drugs Used to Eradicate Relapsing Vivax Malaria.

The most effective drug evolved so far for the eradication of relapsing vivax malaria is primaquine. Strains of *P. vivax* from some countries are readily eradicated by comparatively small doses of this drug. However, the vivax malaria acquired in New Guinea is often resistant to these small doses, and larger amounts of the drug have to be given.

For the eradication of relapsing vivax malaria of New Guinea origin, it is suggested that a course of primaquine be given, consisting of doses of 22·5 milligrammes of base once per day for 14 days. During the first three days of this course chloroquine should be given as well, in the doses recommended for treatment of an acute attack of malaria; the two drugs are synergistic. The patient can pursue his usual activities while this course is taken.

When primaquine is given in these doses, minor toxic effects may be seen, consisting usually of mild abdominal discomfort or nausea. Unless these are severe, there is no indication for reducing the dose. Primaquine at this dosage level can be expected to eradicate relapsing New Guinea vivax malaria in a large proportion of cases. If another relapse occurs, a second course of primaquine may be given.

An attempt to eradicate the infection should be made in all cases of vivax malaria when the person affected is living in a non-malarious area and intends to remain there for a period of more than, say, two or three months. The same course of primaquine with chloroquine may be given to people with presumed latent infections, i.e., people returning to Australia who have probably been exposed to infection in a malarious country. There is no point in giving primaquine to patients in a malarious area; they will be exposed to further infections in any case, and their suppressive will keep them free from attacks of malaria.

Comment.

The drugs listed as suppressives are effective if they are taken regularly (regularity is to be emphasized). Increasing the dosage above that recommended is not advisable. With chloroquine, for example, this may result in the development of a lichen planus type of eruption or difficulty with vision. There should be no necessity to state that quinine should be used to treat a patient with malaria if other drugs are not available.

ROBERT H. BLACK.

School of Public Health and Tropical Medicine, Sydney.

Obituary.

ROBERT OFFICER.

WE are indebted to MR. J. C. STEWART for the following account of the career of the late Mr. Robert Officer.

Robert Officer was a great man and a fine surgeon. His early death at the age of 52 is a personal sorrow to his many friends and patients, and a considerable loss to surgery in Australia.

Born in 1906 in Perth, he was the elder son of the late Dr. Edward Officer, an eminent practitioner in that city. Educated at Hale School, he did his medical course at the University of Melbourne, and during those years was a resident of Ormond College. An outstanding athlete, he won his triple blue in rowing, football and athletics. Graduating in 1931, he became first a resident medical officer and then a registrar at the Alfred Hospital. It was in these years that two of his outstanding characteristics became evident—namely, an unlimited capacity for hard work, and an extreme conscientiousness in looking after his patients. This total absorption in his work appealed to a like spirit in the late Fay Maclure, who became his mentor and lifelong friend, and ultimately they became associated in private practice.

Proceeding to England in 1934 for post-graduate study Officer became a Fellow of the Royal College of Surgeons of England in 1937. The following year he spent at St. Mark's Hospital as a resident medical officer, and his work there in the post-operative care of patients earned him the gratitude of the honorary medical staff of that hospital.

Returning to Australia in 1939, he was made an associate surgeon at the Alfred Hospital for a brief period before enlisting in the Australian Army Medical Corps. He obtained his fellowship of the Royal Australasian College of Surgeons in 1940, shortly before proceeding overseas with the 2/1 Casualty Clearing Station. During the war he served with distinction in Palestine, Syria, Africa and New Guinea, and in addition to his surgical work, he was connected with two major pieces of research. The first of these was in the problems of blood storage, and the second in the uses of penicillin, when that drug first became available for use in this theatre.

At the end of the war, in 1946, he became surgeon to in-patients at the Alfred Hospital, which appointment he held until his death. A fine teacher, he was ever interested in the undergraduates, and in 1948 he was elected Sub-Dean of the Alfred Hospital Clinical School and a member of the Faculty of Medicine. In 1957 he succeeded Dr. Ewen Downie as Dean. His association with the Army Medical Service continued after the war, and in 1948 he was posted as Consultant Surgeon to the Australian Army Medical Corps. In 1950 he was made Honorary Surgeon to His Excellency the Governor-General, and in 1953 he was honoured by being named as Honorary Surgeon to Her Majesty the Queen, prior to her visit to this country.

Officer's integrity as a man and the high standard of his professional skill and conduct made him sought after as a leader in his profession, and in 1946 he was elected to the Victorian State Committee of the Royal Australasian College of Surgeons, and in 1955 he was elected to the Council of that body.

During the war years he married Adele, the daughter of Dr. Catford, as well-known practitioner of Bendigo, and his wife and two daughters were the only interest in his life outside his work. A man who loved his home, it was his great regret that the call of his work allowed him all too little time to enjoy it.

Bob Officer was a man completely dedicated to his work and his patients. Of a quiet disposition, he gave an unwavering loyalty to his friends and his hospital. He was admired and respected by his colleagues, and his premature death is a great loss to the medical profession of this country.

SIR KINGSLEY NORRIS writes: With the passing of Bob Officer closed one phase of the great Hamilton Russell–Fay Maclure surgical tradition which he so splendidly had preserved.

At the outbreak of World War II, Bob Officer immediately enlisted as a junior captain, willingly and cheerfully accepting the considerable sacrifice this entailed for a highly qualified surgeon early in his career. He served in the Desert Campaign and throughout the Middle East, and was largely responsible for the efficiency of the blood transfusion service under most difficult conditions. Beside his surgical contributions, there seemed no task concerning the administration or movement of his Unit that he could not discharge with distinction, such was the sound common sense he always brought to bear on any problem. He continued his service in the South-West Pacific Campaign, during which penicillin became available to the army, and Officer was responsible for the supervision of its first use.

A few years after the war, Colonel Officer was appointed Consultant Surgeon to the Australian Military Forces, and served as Honorary Surgeon to the Governor-General. When the position of Honorary Surgeon to Her Majesty Queen Elizabeth II became available, every member of the Royal Australian Army Medical Corps was indeed proud that this honour came to Bob Officer.

On two occasions I have personally benefited by his surgical care, and I then realized the wonderful confidence his fortunate patients had experienced from his attention. Behind an apparently taciturn reserve, we who knew him realized his humanity and kindliness, his honesty and humour.

It is the sincere hope that his students and all who were privileged to know Bob Officer will preserve, in their associations with their fellow men, the great and rare qualities of our friend. Herein will endure his true memorial as he would have wished it.

MR. JULIAN ORM SMITH writes: I did not get to know Bob Officer until 1939, when we found ourselves in the 2/1 Casualty Clearing Station. Together with others, we suffered the intense and unnecessary discomfort of Puckapunyal, and on the way to the Middle East endured the squalor, which the troops must have found almost intolerable, of a troopship condemned over 20 years before. Then came the freshness and the innumerable moves from camp to camp in Palestine, in which Bob, always movement officer, carried out his duties so efficiently that no one was ever allowed to dispute his claim to this position. Very soon he became stamped in my mind as a very practical man. But his duties on these occasions having been completed and the new camp entered and settled, he would become seized with a languor even more pronounced than that which affected us all. There was not sufficient work to occupy our time, and Bob became

very quiet and gloomy; but never did he become complaining or churlish. As the Unit moved down to Egypt his spirits rose, as did everyone's, for we were following the 6th Australian Division towards the entrance to North Africa.

Shortly before the new year I took a surgical team up to the Western Desert and did not see Bob again for some months, when he brought forward sufficient personnel from the Unit to establish with our team a light section of the casualty clearing station just out of Bengazi. He arrived like a breath of fresh air. He was a man transformed. Although he had been working hard with the main Unit at Mersa Matruh for nearly three months, he was as fit as a fiddle and apparently quite untired. His help, enthusiasm and determination were things that did much to revive my somewhat flagging physical condition. We had long and interesting talks, immensely helpful to me, for he had come to certain conclusions about the wounds of war based on his observations of the wounded treated by different methods sent back from various forward centres. He had sorted out the wheat from the chaff in a most rational manner, and I never ceased to admire, among other things, his knowledge of the use and abuse of plaster of Paris. At this time he played no small part, perhaps unconsciously, in the consolidation of surgical opinion about the first-line treatment of battle casualties. We were together in the Unit at Nazareth during the Syrian campaign, and later on in a site just above Beirut. We returned to Australia, were parted for a time, but then worked together in northern Australia and later at a base hospital.

This narrative is not designed, as so far it may appear, as a composition on my modest comings and goings during this period. My purpose was to explain as simply as possible that for at least four of those six years Bob Officer and I worked together and became friends. Afterwards, being on the surgical staff of different hospitals, we saw each other too infrequently; yet whenever we met the bonds of friendship were quite naturally and easily resumed. There was never any need to pick up the threads.

Bob Officer was a perfectionist. This in some ways was a limitation, for it led him to do much which he might well have entrusted to others. He was a man of great character, and if a few foibles could be discerned there was never a question of any frailty. He could become enthusiastic about projects and events, but he rarely enthused about people, and at times it was perhaps difficult for others to measure the degree of mutual personal feeling which they enjoyed with him. His heart was not worn on his sleeve. I have good cause to remember, however, that once they were bestowed, his friendship and loyalty were abounding. In his behaviour about the real values in life he was one of the most consistent men I ever knew, and with all his grand characteristics this attribute made him a real man among many.

At one time during the war I was working in a general hospital in the field and we were intensely busy. The surgical staff was inadequate. One day a very senior staff officer from Land Headquarters visited us, and in private I told him in no uncertain terms that we had to have some help. I wanted Bob Officer. The very senior staff officer inquired why I wanted him in particular. On the spur of the heated moment I replied: "Because he's Bob Officer." The very senior staff officer was silent for a while, and then quietly said: "You couldn't have given a better reason. You shall have him." The last remark of this simple story was a great tribute, and with the passage of time and events it now becomes imbued with a strange and sad significance. For his friends, Bob Officer's resting place needs no epitaph—his name alone is enough.

DR. MARJORIE E. DAVEY writes: It was remarked at a recent conference which I attended, that perhaps in no other university course than medicine is the student subjected to such a wide variety of influences by so many types of people. Out of this large number, the student usually selects three or four people who colour his whole medical thinking and his outlook during his years of practice. One becomes, as it were, the product of the influence of a few. Much will be written about the academic and surgical achievements of Mr. Robert Officer, but I should like to record some impressions of him as a teacher who thus influenced me, and as a man.

My association with him goes back some thirteen years, when he was in an out-patient surgical clinic at the Alfred Hospital, and I was just starting my clinical years. He seemed then to be quiet, a thorough clinician, and somewhat unapproachable. It was not until I was in his clinic as an in-patient surgeon that I realized that this apparent diffidence was due to shyness. When one got to know him, nothing was too much trouble for him to teach, if he felt the student wished to know. He did not suffer fools gladly, and any student who lied to him about an examination was ignored for the remainder of his term. He demanded a high standard from his students, but he also demanded only the best from himself. With him, the patient always came first. He was never afraid to speak his mind. If we asked him what to do with a certain case, he would often reply: "Do this if you wish to be a good doctor, do that if you wish to get honours in surgery." He made us realize that one could learn all one's surgery from the patient in the ward, by watching him, talking to him and following his progress. He would say: "The ward is your text-book. When you know everything about every patient in this ward, then you can quote books to me, but not before."

Later I became his resident, and found that he still expected the same high standard from himself and those associated with him. He would hold impromptu conferences on the patients, in which the out-patient surgeon, the resident and he would criticize each other's mistakes. Always he would say: "Let us see that this never happens again." He would forgive an honest mistake the first time, but one was never allowed to make the same mistake twice. He treated his public hospital patients with the same courtesy and consideration as he gave to those whom he saw privately. Nothing was ever too much trouble, and he could be relied on in an emergency, whether it was day or night. His little kindnesses to his patients were innumerable; he would talk to them when they were lonely, he would often drive them home.

In the intervening years he gained many honours, but the character of the man never changed. He was always humble, and ever ready to admit his mistakes so that others might learn by them also. He hated to see a patient die, especially a young one, and he would often operate in an apparently hopeless case, to give the patient, as he put it, "a last chance". When death came, he would be upset and quiet for days. He could never bring himself to charge the fees to which he was entitled. A few days before his death he remarked that he could not charge the patient mileage if he was called to the country, for, after all, he was only getting some doctor out of trouble.

When his illness was diagnosed he did not spare himself, and kept up his full programme in spite of pain, but it was quite apparent that he was under a great strain to do a morning's operating. In his last week he said that he had never felt better in his life, and was happy to have done a four-hour session without having to take cortisone.

His death came suddenly, in the way in which he had always said he would prefer to die. He left a place which it will be difficult to fill both for those in the profession whom he helped and influenced and for his patients. But his example and his teaching will long remain in the minds of many. After his death, a patient on whom he had operated came to my surgery, and in the midst of tears, paid him a layman's tribute.

> "He was always so kind, although he didn't say much, and he looked after his patients in the ward so well. He came to see us every day, and he always looked at the wound. He was so thorough that one knew nothing could go wrong. He gave one confidence, for one felt he was in complete control. He never charged enough for all the work he did, and all the hours of his time which he gave. If I ever have to have another operation, I can't imagine what I will do without Mr. Officer."

MR. DOUGLAS MILLER writes: As President of the Royal Australasian College of Surgeons, I would like to have the opportunity of putting on record the deep sorrow the Council of the College feels at the death of Robert Officer. Many of his colleagues on the Council came to know him only after his election a few years ago, and he had quickly established himself in our esteem as a very valued and honoured member. He was not loquacious or keen in debate, but his opinion was mature and balanced and always free from the influence of personalities. He did not indulge in intrigue, but was straight in his dealings, and he enjoyed the good and simple pleasures of human companionship. This quiet, undemonstrative, utterly sincere and capable man could ill be spared in the prime of his life, for his was a full and valuable life, expended in the highest interests of his profession until the day of his death. Such men are rare, and we are indeed the poorer for his passing.

Correspondence.

MEDICINE IN CHINA.

SIR: The letter from Henry W. H. McClelland (M. J. AUSTRALIA, December 6, 1958) is apt to give a false impression of the rapid development that is taking place in China. Dr. Leonard Cox, Professor Sir Peter MacCallum and other prominent medical men who recently visited China gave a different explanation of "the resurgence of traditional Chinese medicine".

On their return to Australia these men, in their addresses, gave the distinct impression that physicians, surgeons and other specialists in China are equally as good as ours in Australia, but that, because of the vast population of China, the demand for medical services is so great that traditional Chinese medicine has been stimulated. This is explained by the fact that doctors cannot be trained sufficiently rapidly to meet the demands of an awakened people.

While Western medicine is more scientifically based, let us not regard ourselves as superior, for we still have a great deal to learn. Much of our treatment is still empirical.

After referring to traditional Chinese medicine, Dr. McClelland concludes by saying: "Perhaps it ought to be encouraged even more—the population increase in China is horrifying." What would our Chinese colleagues think of such a statement? I doubt whether traditional Chinese medicine is so fatal in its effects that population growth would be much affected.

The truth of the matter is that, with the rapid industrialization of China, the development of her rich natural resources, flood control and the employment of the best agricultural techniques, that great country will be able to support a much bigger population.

Yours, etc.,

VICTOR H. WALLACE.

61 Collins Street,
Melbourne,
December 9, 1958.

PHYSIOLOGICAL MECHANISMS IN HEART FAILURE.

SIR: The functional aberrations in heart failure continue to provide grounds for speculation amongst clinicians and investigators. So much so that it is doubtful whether any two investigators, given the task of summarizing current knowledge, would ever agree on the major points of debate. For that reason I do not wish to join issue with my colleague, Sinclair-Smith, on the general thesis which he has presented (M. J. AUSTRALIA, December 6, 1958).

Nevertheless, I would like to make some comments on one form of high output failure, or volume overload, with which I have some acquaintance, namely, that associated with thiamine deficiency. This disease, in its acute form, is characterized by the highest cardiac outputs yet reported in man at rest. Figures of 16 to 20 litres a minute are not exceptional. Limb plethysmography suggests that this high output is due to an enormous arterio-venous shunt in the muscle, and as Dr. Sinclair-Smith remarks, "blood flows from the unobstructed venipuncture with a bright arterial hue". Measurements of pulmonary capillary wedge pressure and right atrial pressure in beriberi have shown that in most cases both are elevated. In the remainder, right-sided pressures only are elevated, and isolated left ventricular failure has never been found.

This is in conformity with the pathological findings of Vedder in the Philippines that dilatation and hypertrophy are greater on the right than on the left side of the heart. It also agrees with my own clinical experience, and the much more extensive experience of Alsmeer and Wenckebach in Java, that pulmonary œdema is seldom as marked as in the more banal forms of left ventricular failure. Indeed, at times it is often merely agonal. Pulmonary arterial pressure under high flow conditions in beriberi has never in my experience exceeded 40 millimetres of mercury.

For these reasons I have difficulty in accepting the conclusion, at least in beriberi, that "the left ventricle fails more rapidly under volume loads, the right under pressure loads".

One further point: despite the fact that the circulation is hyperkinetic and the pulses are throbbing, the precordium *is not necessarily unusually active, and in particular the* hands are not peculiarly engorged and hot, at least in the stage of heart failure. On the contrary, measurement of *hand flow has shown a considerable reduction (which dis-*appears on recovery), and not infrequently the nail beds are cyanosed. Quite clearly this is evidence of the selective vasoconstriction which Dr. Sinclair-Smith recognizes.

Yours, etc.,

R. B. BLACKET.

Royal Prince Alfred Hospital Medical Centre,
100 Carillon Avenue,
Newtown, N.S.W.
December 10, 1958.

THE FUTURE OF THE AUSTRALIAN ABORIGINAL.

SIR: Dr. Barrack, in his article (M. J. AUSTRALIA, December 6, 1958) entitled "The Future of the Australian Aboriginal", deplores the recent move to give full citizenship to our aborigines. It is to be deplored that Dr. Barrack deplores this move, because it is only starting from full citizenship that there can be any hope for them. Actually Dr. Barrack's plan is a retrograde step as compared with what Edward John Eyre had to say in 1845.

This question of citizenship is a vital one for the following reasons. (i) An expert subcommittee of anthropologists and sociologists under the auspices of UNESCO drew up a declaration in 1949, which stated amongst other things that: "Scientists have reached general agreement in recognizing that mankind is one, that all men belong to the same species . . . the scientific evidence indicates that the range of mental capacities in all ethnic groups is much the same." (ii) As a Christian nation we must adhere to the fundamental teaching of Christ concerning the brotherhood of man. Only disbelievers could with any sincerity believe that a section of the community be deprived of their birthright of citizenship. (iii) For the aborigines to have any future in this country of ours, they must have the right to vote. It is not a valid argument to say that few aborigines want to vote. Any group in the community who are voteless are powerless. While an aboriginal does not represent a vote, his affair is something which is crowded out from the serious study of a busy Member. (iv) It is easier to discriminate (on questions of colour, wages and living conditions) against a "slave" than a citizen. (v) Our society is based upon the right to own private property; yet in many States the aborigines have not got this inalienable right to property. This surely is a necessary prerequisite to "integration". (vi) The family is regarded as another bulwark of our society; yet in many States the authorities have the power to separate aboriginal children from their parents. Citizenship would put an end to this nefarious practice. (vii) In many states aborigines are not entitled to all the social service benefits (in spite of paying tax including a social service contribution). If they did get these, then this would lessen the necessity for and their anticipation of degrading charity. (viii) The aborigines in Victoria (the only State where this holds) have full citizenship. This move has increased the dignity of both black and white alike.

Dr. Barrack in his article has referred to the aborigines as a primitive people. The use of the word primitive in this context is almost universal, but in my opinion incorrect.

Mankind sets itself only such tasks as it can solve, and this task itself arises only when the material conditions necessary for its solution already exist, or are at least in the process of formation.

The Asiatic, the classical, the feudal and the modern capitalist modes of production are so many progressive epochs in the economic formation of society. These progressive epochs are not the result of biological advancement—they are not the result of increasing perfection of the human organism, but are merely progressive epochs in economic formation. A necessary prerequisite in the change from nomadism to higher economic formations is the presence of animals suitable for domestication and the presence of plants suitable for pasturage. If these are not present, then these changes will not occur. When the aboriginal first came to Australia, the only Monodelphian animals present were bats and rodents and a few sea mammals in the surrounding oceans. He brought with him his domesticated dog, the dingo. The other mammals that were here when he arrived were the Ornithodelphia and the

Didelphia. There were no Ungulates as there were in other countries—these are the only mammals that have been adapted to husbandry. Australia possessed no native plants that were readily taken into cultivation for the benefit of the primitive agriculturist. Indeed, the white colonist has made no more conservative use of the native animals and plants of Australia than did the aboriginal, for in no single instance has he adapted to his needs any animal or plant indigenous to Australia.

This is the reason why I feel that the noun savage should be discarded from our diction, and that the words primitive, backward, lowest (and perhaps even Stone Age), if they be used at all, should describe only economic epochs—not people or races.

Dr. Barrack has placed great emphasis on the question of alcohol, and quite rightly so. However, I feel that his proposed solution of the problem is incorrect. Excessive consumption of alcohol by the aboriginal is a symptom of his complaint, and is not the disease itself. The disease is lack of citizenship, low wages and colour prejudice. Once the disease has been cured, then this symptom will disappear. As a doctor, he must agree that the aboriginal is our biological equal, and hence the physiology of his central nervous system and alimentary system is the same as ours. Since this is the case, and once the disease has been cured, the problem of alcohol becomes the same for black and white.

In two isolated areas the aboriginal problem has been "solved", in both cases by way of cooperatives. These two cooperatives are Pindan Pty. Ltd. at Port Hedland and the Lockhart River Mission in northern Queensland. These two projects have shown that "integration" is possible in a few years, and not in two, three or five generations as Dr. Barrack suggests.

Yours, etc.,

366 Church Street,
Richmond, E.1,
Victoria.
December 11, 1958.

BARRY CHRISTOPHERS.

THE PATIENT, THE SURGEON AND THE ANÆSTHETIST.

SIR: This time last year I posed this question in a letter to the Editor (M. J. AUSTRALIA, December 28, 1957):

> What should be the anæsthetist's response when he is asked to give an anæsthetic to a desperately ill patient who, in the opinion of his surgeon, may possibly be saved by operation, but who, he thinks, is sure to die if operation is withheld?

Some interesting letters appeared in the Journal in the following weeks, but not one of your correspondents answered my question. I now ask leave to repeat it, in the hope that some enlightening replies will be offered this time. Or do you think that I should try another journal?

Yours, etc.,

185 Macquarie Street,
Sydney,
December 8, 1958.

M. P. SUSMAN.

TROPICAL PULMONARY EOSINOPHILIA.

SIR: If it were not for your timely "Current Comment", the provocative paper on the above subject by Dr. J. Kariks (M. J. AUSTRALIA, December 6, 1958) might have misled those readers unaware of recent overseas work.

Buckley,[1] in expanding his initial observations (Buckley[2]) reviews the literature in relation to the microfilarial causation of tropical pulmonary eosinophilia. He suggests that animal filarial parasites may grow to maturity in man, producing microfilariæ which perish in lymph glands and produce an allergic response—i.e., tropical pulmonary eosinophilia. An analogous response is that of Löffler's syndrome produced by animal "larva migrans" or migrating larvæ of *Ascaris*.

Buckley's theory is more acceptable than that put forward by Dr. Kariks; but in such case the animal filarial parasite responsible for tropical pulmonary eosinophilia in New Guinea is unknown. *Dirofilaria* infestation is very common in dogs in the area, and has previously been reported (Beaver[1]) as causing Löffler's syndrome in man. Bats, birds and probably other animals in New Guinea harbour similar parasites; but the host-vector complex is probably not as closely related to man as is the host-vector complex of dog.

If Case V is accepted as one of tropical pulmonary eosinophilia, it should be pointed out that no authentic record can be found of a European contracting *Wuchereria bancrofti* infestation in the Territory of Papua and New Guinea.

Yours, etc.,

Department of Parasitology,
School of Public Health and Tropical Medicine,
Sydney.
December 10, 1958.

B. MCMILLAN.

[1] *East African M. J.*, 1958, 35:493.
[2] *Tr. Roy. Soc. Trop. Med. & Hyg.*, 1958, 52:335.

MUMPS ENCEPHALITIS IN AN ADULT.

SIR: I wish to record the experiences of a patient who recently suffered from mumps encephalitis at the age of 36 years.

Five days after the appearance of the bilateral parotitis, he developed severe frontal headache, persistent depression and restlessnss at night. On the following day, although feeling exhausted, visual hallucinations became prominent while awake with the eyes closed. These hallucinations disappeared on opening his eyes. They lasted in all for five days. The types of hallucinations were in his case as follows: (*a*) balls of flame passing in front of his eyes, which felt hot and inflamed; (*b*) specks rotating around the head in distinct and consistent orbits; (*c*) a view of a mountain side covered with people, who then started to roll down the mountain; (*d*) people peering at him. He then noticed difficulty in joining a conversation and impairment of concentration power. His comprehension of sentences and his memory have been impaired. There has been agnosia for letters, word blindness and acalculia.

At present some residua of the attack persist. His concentration powers and memory have not yet fully recovered. He has difficulty in planning and in thinking deeply, although it is now six weeks since the attack began.

No lumbar puncture was performed, but doubtless would have revealed a concomitant mononuclear pleocytosis.

As this is a comparatively rare condition which has been infrequently recorded in the literature, I consider the symptomatology of the case would be of interest.

I am indebted to Dr. Allan Macdonald for his permission to publish this case.

Yours, etc.,

Hight Street,
Toowong,
Brisbane.
December 9, 1958.

HOWARD WAGNER.

Public Health.

GAMMA GLOBULIN PROPHYLAXIS.

THE following statement was issued by the Commonwealth Serum Laboratories, Parkville, on November 11, 1958.[1]

The use of gamma globulin prepared from pooled human serum for the prophylaxis of rubella has yielded contradictory results. In much of the earlier work, small doses of gamma globulin were used—0·035 ml. per lb. body weight, equivalent to 5 ml. for an average female adult—and it is likely that the variation in protection has varied with the antibody in the different samples of gamma globulin.

Recent work by Krugman and Ward and Houser and Schalet has shown good protection against rubella with large doses of gamma globulin, both with experimental infection and during an epidemic in the field. Protection was afforded by large doses of gamma globulin, 0·14 ml. per lb. bodyweight being equivalent to about 20 ml. for the average adult female.

[1] *South African M. J.*, 1957, 32: 42.
[2] See also "Current Comment" (page 23).

It is, therefore, recommended that women exposed to rubella during the first trimester of pregnancy should be given 20 ml. intramuscularly of gamma globulin.

The use of gamma globulin for the prophylaxis of infectious hepatitis was established by Stokes and Neefe in 1944 with large doses of 0·15 ml. per lb. bodyweight. Since that time much work has been carried out with the protection of patients against this disease by gamma globulin with smaller doses, even as low as 0·01 ml. per lb. bodyweight. However, it has been shown that whilst this small dose prevents a clinical manifestation of jaundice, subclinical non-icteric infection with altered liver function tests may occur. Whilst with larger doses there may be some subclinical infection, it is of much less frequent occurrence.

The recommendation for the prophylaxis of infectious hepatitis is, therefore, 0·03 ml. per lb. bodyweight intramuscularly of gamma globulin, being equivalent to about 5 ml. for an average adult. As the incubation period of infectious hepatitis may be 25 days or more, it is recommended that the gamma globulin be given as soon as possible after contact up to the time of clinical manifestations of the disease.

The recommendations made by the Commonwealth Serum Laboratories for the prophylactic use of gamma globulin are as follows:

Rubella: 0·14 ml. per lb., i.e., 20 ml. per adult female.

Infectious hepatitis: 0·03 ml. per lb., i.e., 5 ml. per adult.

Measles: Prevention, 0·1 ml. per lb.; modification, 0·025 ml. per lb.

Poliomyelitis: 0·14 ml. per lb.

Post-Graduate Work.

ROYAL PRINCE ALFRED HOSPITAL: EAR, NOSE AND THROAT DEPARTMENT.

Seminar Programme, 1958-1959.

THE staff of the Ear, Nose and Throat Department will conduct a seminar on the second Saturday of every month at 8 a.m. in the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital. The main speaker will not exceed forty minutes, and there will be a discussion at the conclusion of his remarks. All medical practitioners and clinical students are invited to attend.

At the next seminar, to be held on January 10, 1959, Dr. R. G. Mackay will speak on "The Management of the Fractured Nose".

Notes and News.

Orthoptic Council of New South Wales.

The Orthoptic Council of New South Wales offers a course of instruction in orthoptics, of two years' duration, commencing on February 9, 1959. Applicants must be aged 18 years without the leaving certificate or 17 years with it. Applications should be made to the secretary, Dr. M. Sterling-Levis, 235 Macquarie Street, Sydney, by January 24, 1959, and three original references should be submitted.

The Australian National Committee for the Prevention of Alcoholism.

The Australian National Committee for the Prevention of Alcoholism, affiliated with the International Commission for the Prevention of Alcoholism, has just been formed. The president of the International Commission is Dr. Andrew C. Ivy, of the Illinois University, and the secretary is Professor W. A. Scharffenberg, of Washington, D.C. The object of the Australian Committee is to present to the people of Australia the scientific, cultural, economic and moral effects of alcohol on society, and its members come from twelve fields of activity, including medicine, law, religion, sport, business, education, social welfare, politics, etc. The president of the Australian Committee is Senator Ian Wood, of Mackay, Queensland, and the honorary president is Mr. G. F. R. Nicklin, Premier of Queensland. The Committee proposes to conduct institutes of scientific studies for the prevention of alcoholism at universities, and to supply research material to educators, churches, government bodies, the Press, and radio and television authorities. It is intended that the first session will be held from January 18 to 29, 1960, at the University of Sydney.

British Medical Association: The Brackenbury Prize, 1960.

The Council of the British Medical Association is prepared to consider the award of the Brackenbury Prize in the year 1960. The prize, approximately £100 in value, will be awarded at the discretion of the Council for the best contribution on "The Problem of the Aging Population".

Any member of the British Medical Association is eligible to compete. The work submitted must include personal observations and experience. A high order of excellence will be required and regard will be paid to literary form as well as to the practical importance of the contributions. No report or study that has previously been published in the medical Press or elsewhere will be considered eligible for the prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his entry, the decision of the Council shall be final. Should the Council of the Association decide that no entry submitted is of sufficient merit, the prize will not be awarded in 1960, but will be offered again in a succeeding year. Each entry, which must be typewritten or printed in the English language, should be unsigned, but accompanied by a note of the candidate's name and address. It is suggested that reports should be of the order of 10,000 words.

Preliminary notice of entry for this prize is required on a form of application to be obtained from the Secretary. Entries must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1960. Inquiries relative to the prize should be addressed to the Secretary, Dr. D. P. Stevenson, at the address given.

International Congress of Gastro-Enterology.

The sixth Meeting of the Association of the National European and Mediterranean Societies of Gastroenterology, organized by the Association of Dutch Gastroenterologists, will be held in Leiden, the Netherlands, from April 20 to 24, 1960. The main themes of the conference will be (i) pathology of the small intestine and (ii) hepatitis, cirrhosis hepatitis and their possible connexion. Panel discussions, lectures and film shows will be arranged in connexion with these themes and related subjects. Scientific and technical-commercial exhibits will be also organized.

Original reports on these subjects or any other gastro-enterological subject, either clinical or in the field of the basic sciences, are invited for submission, and will be accepted for panel discussion or publication if approved by the scientific programme committee.

Titles for papers, together with a summary of not more than 200 words, should be sent not later than August 1, 1959, to Dr. B. K. Boom, Congress Office, Department of Gastro-enterology, University Hospital, Leiden, the Netherlands.

The official language will be English, and the working languages will be English, French, German and Spanish (with simultaneous translation). The registration fee (including an official reception, a banquet and an excursion) will be $45 (United States) for a full member and $20 (U.S.) for accompanying family members. After November 1, 1959, the registration fee for full members will be $55 (U.S.). The fees quoted in United States dollars can be paid also in Dutch guilders or any other transferable currency. For further information and registration, apply to the Congress Office of the sixth Meeting of the Association of the National European and Mediterranean Societies of Gastroenterology, Department of Gastroenterology, University Hospital, Leiden, the Netherlands, or to the secretary of the national society of gastro-enterologists.

Nuffield Dominion Travelling Fellowships.

The Chairman of the Nuffield Foundation Australian Advisory Committee, Mr. Colin Syme, has announced that Nuffield Dominion Travelling Fellowships in medicine for 1959 have been awarded to Dr. D. J. Deller, of Sydney, and Dr. J. V. Hurley, of Melbourne.

Dr. Deller is Medical Registrar at the Royal North Shore Hospital of Sydney. He will undertake research in hæmatology at the Post-Graduate Medical School, University

of London, under Dr. J. V. Dacie, and at the Department of Medicine, University of Edinburgh, under Dr. R. H. Girdwood.

Dr. Hurley is Senior Lecturer in Pathology at the University of Melbourne. He proposes to conduct research in the related fields of connective tissue and the mechanism of acute inflammation at the Pathology Department, University College Hospital, under Professor Sir Roy Cameron, F.R.S.

International Society for Human and Animal Mycology.

A meeting of the International Society for Human and Animal Mycology was held from September 9 to 11, 1958, at the Institute of Tropical Medicine, Lisbon, concurrently with the Sixth International Congresses on Tropical Medicine and Malaria. In addition, three sessions of the Congress on Tropical Medicine were devoted to medical mycology. The first of these, on clinical and epidemiological aspects of mycoses, was opened by Dr. Carlos da Silva Lacaz (Brazil), and papers were read by Dr. R. Vanbreuseghem (Belgium), Dr. E. Drouhet (France), Dr. A. Solazar Leite (Portugal), Dr. Peter Abbot (United Kingdom) and Dr. P. Destombes (France). The second, on the ecology and saprophytic occurrence of pathogenic fungi, was opened by Dr. Chester W. Emmons (U.S.A.), and papers were read by Dr. G. C. Ainsworth (United Kingdom), Dr. H. J. Lurie (Union of South Africa), Dr. Roger O. Egeberg (United States of America), Dr. E. Beatrix Durie (Australia) and Dr. N. Van Uden (Portugal). The third session, on biochemistry and physiology of pathogenic fungi, was opened by Dr. M. G. Segretain (France), and contributors were Dr. Aldo Castellani (Italy), Dr. H. Seeliger (Germany), Dr. F. Mariat (France) and Dr. Manuel Pereira Miguens (Spain).

It was decided to hold meetings of the International Society of Human and Animal Mycology at intervals of approximately two years, concurrently with international meetings dealing with allied subjects. It was also decided to embark on the publication of an international journal in addition to the Bulletin already issued by the Society. Dr. Juan McKinnon of Uruguay was elected President for the ensuing year. Professor R. Vanbreuseghem, of the Institut de Médecine Tropicale, Antwerp, Belgium, continues to act as General Secretary, and will be pleased to hear from anyone who wishes to become a member of the Society.

Code for Protective Respiratory Devices.

The Standards Association of Australia announces the distribution for public review of a draft code of practice for protective respiratory devices, issued as Document 408.

This is to be one of a series of codes of safety practice being prepared under the ægis of the S.A.A. Safety Standards Committee. It applies to the selection, use and maintenance of personal protective devices for the protection of the respiratory organs against hazardous dusts, gases, vapours, etc. Such hazards are encountered in a wide range of industrial occupations, and the purpose of the code is to afford authoritative guidance as to safe working practices where respiratory protection is required.

The draft includes a classification of respiratory hazards and a section describing the types of protective devices available and providing principles for selection of the correct type. Recommended practices for issue and maintenance are also given.

The Association will welcome constructive criticism of the draft and suggestions for its improvement from any organization with experience in the supply and use of such equipment. Copies of Document 408 may be obtained from S.A.A. Headquarters, 157 Gloucester Street, Sydney, and from branch offices in capital cities and at Newcastle. Comment should be sent to the Association not later than March 31, 1959.

Ninth International Congress of Paediatrics.

The ninth International Congress of Pædiatrics will be held on July 19 to 25, 1959, at Montreal, Canada, under the patronage of Her Majesty the Queen.

The scientific programme is designed to follow the chronology of childhood, starting with the cell and progressing through to adolescence, each subject being developed through initial plenary sessions leading to panel and round table discussions. Scientific exhibits, of which a large number have already been submitted, will be selected to complement the scientific sessions. The Congress Committee is sparing no effort to make the scientific programme an outstanding educational achievement. Participants in the programme will be those who have proved themselves to be outstanding workers in each field, and will be drawn from all corners of the globe. Friday afternoon (July 24) is being reserved for three addresses of particular significance.

Post-graduate students, introduced by their departmental heads, are welcome to attend the Congress at the reduced registration fee of $20.00 (the deadline for which is April 30, 1959).

All registrations should be in by January 31, 1959. Further information may be obtained from the Secretary-General, P.O. Box 215, Westmount, Montreal 6, Canada.

Diary for the Month.

JAN. 9.—Queensland Branch, B.M.A.: Council Meeting.
JAN. 19.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
JAN. 22.—Victorian Branch, B.M.A.: Executive of the Branch Council.
JAN. 23.—Queensland Branch, B.M.A.: Council Meeting.
JAN. 28.—Victorian Branch, B.M.A.: Branch Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales. The Maitland Hospital.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this Journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in Australia can become subscribers to the Journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 per annum within Australia and the British Commonwealth of Nations, and £6 10s. *per annum* within America and foreign countries, payable in advance.